



NEWSLETTER

NUMBER 61

JULY 2013

Iontaobhas Oidhreacht Mianadóireachta na hEireann

Mining Heritage Trust of Ireland

DIARY DATES 2013

(**Bold print** indicates finalised programmes; further details will be sent to members of events in ordinary print; *italics* indicates non-MHTI activities)

2013

- Aug 2-5 *Dig Deep Castlecomer Underground (Part of The Gathering)*
Aug 8 MHTI Board meeting TBC
Aug 10-11 Wexford and Waterford fieldtrip, led by Des Cowman
Aug 17-25 *Heritage Week*, <http://www.heritageweek.ie/>
Aug 17 *Little Ireland: the mining town of Cleator moor, Cumbria, and its links with County Wicklow (meeting).*
Aug 17-25 *Our Copper Mining Heritage exhibition, (Co. Waterford).*
Aug 17-25 *Walk from A to B (Allihies, Co. Cork to Bunmahon, Co. Waterford).*
Aug 18 *Mountcharles Heritage Walk, including sandstone mines (Co. Donegal).*
Aug 18 *Maghera Heritage & Wildlife Walk, inc visit to soapstone mine (Co. Donegal).*
Aug 18 *The Avoca Copper and Sulphur Mines Walk (Co. Wicklow).*
Aug 20 *Copper Coast Mining Heritage Films (Co. Waterford).*
Aug 21 *A welcome to the wonderful colourful world of Gemstones (Galway).*
Aug 23 *Between rocks and hard places (talk in Sligo).*
Aug 23 *The Story of Wicklow Gold (talk).*
Aug 24 *Ancient Technology Demonstration (Co. Kerry).*
Aug 25 *Guided Walk and Free Entry to Allihies Copper Mine Museum (Co. Cork).*
Aug 25 *A visit to the Mountcharles Sandstone Mines, Co. Donegal TBC (Heritage Week)*
Aug 20-24 *"Stories written in stone": international symposium on chert and other knappable materials. (Romania)* <http://arheoinvestsymposium.uaic.ro/stone>
Sept 12-15 *Allihies Connects (Part of The Gathering)*
Sept 12-15 International Conference about Geological and Mining Heritage, Spain. <http://www.e-faith.org/home/?q=content/geological-and-mining-heritage-driving-force-local-development>
Sept 14-15 *European Heritage Open Days (NI)*
Sept 27-29 **Parys Mountain & Great Ormes Head fieldtrip, North Wales. Details inside**
Sept 28 - Oct 5 *19th Australian Mining History Association Annual Conference* <http://www.mininghistory.asn.au/conference/>
Oct 17-19 *"The forgotten state of industry: Irish industrial landscapes and heritage in a global context". See inside for details*
Oct 25-27 *European Industrial Heritage Weekend, Switzerland.* <http://www.e-faith.org/home/>
Nov 8 MHTI Board meeting TBC
- ### 2014
- July 6-13 International Mining History Congress & Australasian Mining History Association Conference, Queensland. <http://www.ct2014miningcongress.com/programme.html>
Check with organisers of meetings before making any travel bookings in case of change of dates or arrangements. MHTI lists events in good faith but is not responsible for errors or changes made. For MHTI fieldtrips please register your interest, without commitment, so the organiser can keep you informed.

WWW.MHTI.COM

MHTI MEMBERS' BUSINESS

If you have any contributions for Newsletter 62 to issue in September, please contact the Editor. Thank you.

Contact **Matthew Parkes** for newsletter contributions 087-122 1967 or mparkes@museum.ie

Email Newsletters versus postal

This is a fresh plea to anyone who currently receives the newsletter by post as a printed copy, to let us know if you are willing to move over to getting the newsletter by email. There is an additional cost to MHTI, in printing and posting copies, which it would be good to reduce wherever possible. However the main issue is the extra work involved in printing stapling, folding, stuffing envelopes and cross checking address labels are up to date against paid up membership records. Then if you haven't yet paid but we know you probably will with a reminder, then I have to make a judgement call as to whether to keep on sending the newsletter in reasonable expectation of your renewal. All of which is a loss of my time I could do without. So please email me mparkes@museum.ie if you are willing to switch over to email. The newsletter is sent as a pdf and the software to read pdfs is normally installed on most computers. It is available free if not.

VADA to develop Mine Heritage Centre

Fresh post on MHTI Facebook page:

VADA (Vale of Avoca Development Company) look forward to working with you in developing our Mine Heritage Centre in the Old Court House.

Du Noyer Photography Competition

The Geological Survey of Ireland are inviting people to photograph interesting geological landscapes in Ireland or abroad. The closing date for entries is Friday 11 October, and prizes totalling €500 will be awarded in December. Click on the link to view more information, previous competition results, and images from the Du Noyer archives.

<http://www.gsi.ie/Education/Du+Noyer+Photography+Competition.htm>

Creevelea Ironworks, Co. Leitrim

Newsletter 9 (December 1998) mentions "a photograph of Creevelea borrowed from a local house and dated 1905 showed what looked like almost contemporary buildings". The photograph may be similar to the one published in Meehan, J., 1906. The Arms of the O'Rourkes: a metal casting from County Leitrim seventeenth century foundries. The Journal of the

Royal Society of Antiquaries of Ireland, Vol 36, p123-142.

The photo on page 133 is captioned "Creevelea Iron Works, 1905. Last place in Ireland where Iron has been manufactured. (From a Photograph by the Rev. Joseph Meehan, c.c.)"

Alastair Lings

Errata and Addenda to Wilson, C.B. Douglas Wallace Bishopp – Seventh Director of GSI: His appointment 1940 and resignation 1950. In JHMTI 10, 2010, 21-28

Errata

p.23 lhc, 17th line: For Sulitzelma read Sulitjelma

p.27 rhc, 6th line from bottom: For March read May

Addenda

p.24 rhc, 3rd line below Family Accommodation: For A house at Greystones, Co. Wicklow read "Moyhora" Greystones, Co. Wicklow

Add the following three items to the Appendix – bibliography – Ireland:

Oakley, K.P. *British Phosphates*. Geological Survey of Great Britain Wartime Pamphlet no.8 Part 4, 1942 (Bishopp p.9-10)

Contribution to the discussion: Harty, V.D. *Site*

Investigations for Reservoirs and Dams. Trans.

Instn. Civ. Engrs. Ir., Vol. 72, 1946, pp.161-195

(Bishopp p.188-9)

Correspondence: Age of the Portsalon Conglomerate.

Geological Magazine Vol. 89, Issue 01, February 1952, p.70.

From 21 May 1941 to 30 November 1943 Vernon Harty was the Managing Director of Comhlucht Gual Lathrach Shliabh Ardachadh, Teoranta, the State sponsored and funded Slievardagh coalfield mining company. Following this stint he returned to the E.S.B. where he was Chief Civil Engineer.

I was aware that Bishopp had used maps to illustrate his lecture to the Geological Society London *The Scope and Future of Geology in Ireland* 15 January 1947. Evidently he also exhibited rock samples, one being Portsalon conglomerate.

Colin Wilson, 3 April 2013

AditNow 2014 calendar

The AditNow calendar is sold to raise money for mine-related good causes. In total it has raised £3333. If you have three or more photographs of a particular mine, you are invited to submit them for publication, before the end of August. Further details are at <http://www.aditnow.co.uk/community/viewtopic.aspx?t=8353>

EVENTS: NOTICES AND REPORTS

MHTI AGM Report, Silvermines, May 2013

The Annual General Meeting of the MHTI (for 2012) was held 25th and 26th May 2013, centred around the Silvermines District in Co. Tipperary. The business meeting of the AGM took place on the Saturday afternoon at the Abbey Court Hotel, Nenagh. During the AGM the accounts for 2012 were presented to the members of the Board and Alastair Lings (chairperson) gave a summary of events undertaken during the year. Fielding Flynn were appointed as auditors for 2013. Martin Critchley and Mick Carragher were re-elected as Directors, and Nick Coy stood down. Sharron Schwartz and John Gibbons were appointed as Directors. It was agreed unanimously by the members that a new website is urgently needed for the MHTI and Dr. Sharron Schwartz was tasked with overseeing the design and implementation. The reintroduction of an annual overseas field trip was also discussed and it was agreed go ahead on a two year trial. In 2013 we will run a trip to North Wales to look at Bronze Age mining (see separate notice in this newsletter) and in 2014 (possibly September) Sharron Schwartz and Martin Critchley are arranging a trip to the Medieval mining town of Banská Štiavnica in Slovakia (for more details please contact Martin by email, mcritchley@era.ie)

On the Saturday evening, Dr. Peter Claughton of Exeter University and MHTI member, gave a keynote talk on Medieval silver mining and smelting in Europe. Peter set in context the known Medieval silver workings in Ireland and give us some clues of the types of features we should be looking for in the field that give indications of additional lead mining and smelting sites from this period. John Morris, who oversaw the recent conservation works to the nineteenth century engine houses at Silvermines, gave a talk on these works and the benefits and pitfalls of EU funding programmes in which the MHTI has been involved. Of special interest was an illustrated talk by members of the Silvermines Historical Society (SHS) on the history of the Mogul Mine and some of the people who worked there. The SHS has just published an excellent history of Silvermines in their book *Mining the Past* (for details of SHS see <http://www.facebook.com/pages/Silvermines-Historical-Society/352800274817780>)

On the Sunday there was a surface walk around Silvermines guided by John Morris visiting the conservation works undertaken at Ballygowan and Knockanroe. During an excellent lunch in Hayes Bar at Silvermines, Eamon de Stafort (MHTI honorary member and long time proponent of the mining

heritage at Silvermines) showed series of photographs relating to mining at Silvermines over the years. In the

afternoon we look a quick look at the conservation works on the engine house at Shallee. This was followed by an inspection of open cut workings with the aim of seeking any visual remains which might be related to Medieval mining. Unfortunately, heavy vegetation hampered progress and lack of time restricted access; further work is needed here. Following the presentation by Peter Claughton the previous evening it was apparent that it would be difficult to differentiate Medieval workings from later workings. At Silvermines there are reports of mining back as far as 1279 and at Glendalough in Co. Wicklow recent analysis of peat cores hints at the presence of Medieval lead working. According to Peter some clues to look for would be the scale and size of extracted ore waste and slag remains from smelting (if it occurred there). We look forward to future investigations of lead mine sites in Ireland for evidence of Medieval mining. Finally Martin Critchley led a visit for some members to the underground mine workings at Shallee.

Martin Critchley



MHTI AGM



**Near the 1950s calamine processing plant,
Ballygowan**



In the Bag House, Ballygowan



Shallee Engine House



MHTI members and guests at Ballygowan Engine House



Above the opencut workings at Shallee, with Gortmore Tailings Management Facility in the distance.

Chairmans Report for 2012

2012 was another busy year for your Directors. We held four meetings of the Board, with an average attendance of seven people. We issued four Newsletters, a total of 52 pages, and an excellent Journal of 106 pages.

We had eight days of fieldtrips spread over four weekends. Attendance varied from four when we visited Galmoy Mine, the maximum possible, up to 30 when we visited the Mountcharles Sandstone Mines in County Donegal.

In March Mick Carragher organised visits to Galmoy and Lisheen Mines which were fully booked at four and eight people respectively. Please accept my apologies for a lack of notice about the Galmoy visit. A couple of days later Nick Coy led a trip around Avoca, assessing the heritage value of the structures and the threats they faced. 19 people attended the fieldtrip.

17 people attended last year's AGM weekend in Castlecomer, organised by Seamus Walsh, and we got a chance to go underground in the coalfield.

In July Theo Dahlke organised a visit to Allihies with 17 people attending visits to Reentrusk bronze-age mine, Urhin Mine and Mountain Mine. Unfortunately the Sunday was damp, but we had a good look around the Dunboy Castle area.

In September seven members toured the mines of south Donegal. Our numbers were boosted by 23 local people for our visit to the Mountcharles Sandstone Mines.

During the year we responded to various consultations:

- A general query about Decco's Hole, a mine on the coast at Dalkey, Co. Dublin.
- In May RTE contacted us wanting ideas for a TV programme that would show teams competing to build or restore equipment. We suggested restoring coal-cutters at Arigna, Co. Roscommon.
- In June we responded to a planning application by Galway County Council, wanting to develop a cycle route past Glengowla Mine. Unfortunately the Planning Board do not seem to have taken our ideas on board. Matthew Parkes represented MHTI at an inquiry in December.

Back in 2011 Barry Flannery set up a Facebook Page for MHTI. This presently (25/05/2013) has 151 "Likes" and last week 2143 people visited the Page. Looking to the future, we have a good programme of fieldtrips ahead of us. We need to work closer with local groups, and we need a new website.

The Directors, contributors to the Newsletters and Journal, landowners and mine operators, the Department of Communications Energy and Natural Resources, corporate supporters, members and attendees at our events have made 2012 a successful year. Thank you all.

Alastair Lings

A Find in the Field at Silvermines

Following an underground trip into the mine workings at Shallee at this year's AGM field meet, one of the local group asked us to look at an artefact that had been discovered on the bank of a stream not far from the Shallee engine house. The artefact, somewhat corroded and covered with mud, is a large cast iron tipped square baulk of wood with an iron pivot at its tip, and has iron strapping plates. First of all there was some speculation as to whether it was associated with the nose pin of the engine bob which connected to the pumping rods from the Shallee high pressure steam engine sited in a house on the flat ground above. It is most certainly pumping related, but on further examination we believe it to part of a flat rod assemblage, possibly a part of an angle bob installation serving a shaft in the vicinity - however we would welcome any comments or alternative suggestions.

This conclusion was strengthened by the discovery of a leat above the river, betrayed by three metal bolts that appear to have been part of a weir to regulate water flow, close to where the artefact was discovered. This suggested that there must have been a waterwheel installation nearby and indeed, we found two parallel walls of masonry almost obscured by vegetation. This was the casement for a waterwheel we estimate to have

been in the region of 32 feet in diameter, possibly breast shot. We speculate that it was working flat-rods in Field Shaft which lies about 50 metres to the south and with which it is aligned. The artefact was presumably abandoned or lost when the waterwheel and pumping assemblage were dismantled/scrapped. Documentary research had led us to speculate that we could have found archaeological evidence for a reference to the waterwheel that was erected towards the end of 1863 'to test the lode at greater depth'.

These great finds highlight the importance of conducting a future field study of the relict mining landscape at Shallee and Silvermines and ensuring that the results are compiled into a GIS to create a more complete understanding of the interrelationship of the discrete features and in order to shed further light on the mines' development. An article about the history of Silvermines under the General Mining Company For Ireland period, with special reference to the Cornish engine houses and other monuments of industrial archaeological interest, will be published in a future issue of the MHTI Journal.

Martin Critchley and Sharron Schwartz



Wood and metal artefact discovered at Shallee, possibly connected to an angle bob installation at a nearby shaft.

Sat. 10th August – MHTI Field Trip to South East (Leader Des Cowman)

Meet 11.30 in car park of Riverside Park Hotel, Enniscorthy (from Dublin do not cross bridge but along Promenade on town side of Slaney). Visiting 19th century lead mines of Caime and Ballyhyland. On then to Bannow Bay's 16th and 19th century silver/lead mines. Visit to Copper Coast Centre and new mining presentations.

Should anybody wish to stay overnight, visits can be made to other locations including the sites of 17th century iron mines in west Waterford.

Contact Des at 051-396157 or descowman@gmail.com

NOTICE: 'Little Ireland': The mining town of Cleator Moor, Cumbria, and its links with County Wicklow Sat 17 August : 19:00 - 20:30

There is a long tradition of metal mining in County Wicklow. At Glendalough, Glendasan, Glenmalure and Lough Dan, 'the Glens of Lead', galena was mined for over two hundred years, only ending at Glendasan in the late 1950's. Extensive copper and pyrite mining also took place at Avoca with the last mine closing in 1983. During the periods of mining there were strong migration networks between Wicklow and mining regions in Great Britain, especially Cornwall and north-western England. Through on-going research, Glens of Lead has discovered that one of the most prominent migration networks was with the coal and iron mining area centred on Whitehaven and Cleator Moor in Cumbria (an area which was called 'Little Ireland' in the 19th century) and has made contact with local groups and individuals to further explore the links. Glens of Lead is delighted to welcome to Wicklow, local historian and Egremont Borough Councillor, Dave Banks, to an evening of illustrated presentations that will explore some of the fascinating and forgotten links between Wicklow and Cumbria. Discover when and why people migrated to Cumbria, find out where they lived and worked and what life was like in these Victorian mining settlements. If your family migrated to or from Cumbria (or even elsewhere) we hope you will come along to share your stories, and please do bring any photographs or other information about your Wicklow mining ancestors.

Venue: Glendalough Visitor Centre
Glendalough, Co. Wicklow
There is no charge for this event

For more details contact Martin Critchley (mcritchley@era.ie)

NOTICE: The Forgotten State of Industry? Irish Industrial Landscapes in a Global Context

Featuring a presentation keynote speech by leading industrial archaeologist, **Professor Marilyn Palmer**, this exciting two day international conference brings together an exceptional group of speakers from across Ireland, Europe and beyond, providing an opportunity to share experiences of conserving, managing and presenting our historical industrial landscapes, many of which in Ireland are poorly understood and vulnerable. Largely funded with the support of the InterReg 4A (Ireland-Wales) *Metal Links: Forging Communities Together* project, with additional support from the Heritage Council, Wicklow County Council and the Gathering Fund, the conference is being organised by community group, Glens of Lead, a partner in the *Metal Links* project.

This conference represents exceptional value for money. There is no fee for attending, only a charge to cover refreshments, lunches and dinner. Places are limited, so book early to avoid disappointment! All bookings via <http://glensoflead.eventbrite.ie/>

The venue is the Glendalough Hotel in the heart of the Wicklow Mountains, Ireland, one hour south of Dublin.

For details of local accommodation see: http://www.glendalough.ie/accommodation_in_glendalough.php

CONFERENCE PROGRAMME DAY 1: Friday 18th October

8.00-9.00 Registration

9.15-9.30 Welcome by Minister for the Arts, Heritage and the Gaeltacht, **Jimmy Deenihan TD**

Session 1: Promoting Industrial Heritage in a Transnational Context (Chair: Dr Colin Rynne)

09.30-10.15 **Stephen Hughes** (Secretary of the International Committee for the Conservation of Industrial Heritage (TICCIH) and Metal Links Project Director) 'TICCIH, A World Forum for Industrial Heritage'.

10.15-11.00 **Professor Wolfgang Ebert** (European Routes of Industrial Heritage) 'ERIH-Forging Links Across Europe'.

11.00-11.30 *Coffee*

Session 2: Challenging and Changing Perceptions of Industrial Heritage (Chair: Dr Sharron P. Schwartz)

11.30-12.00 **Professor Huw Bowen** (Swansea University) 'Wales: "First Industrial Nation"'

12.00-12.30 **Ainsley Cocks** (Cornish Mining World Heritage Site) "'Our Mining Culture Shaped Your

World": The Cornish Mining World Heritage Site'.
12.30-13.00 **Peter d'Auvergne** (The Sovereign Hill Museums Association, Victoria, Australia) 'Sovereign Hill: Industrial Heritage in a "Living Museum"'.
13.00-14.00 Luncheon

Session 3: Industrial Heritage Tourism and Urban Regeneration (Chair: Dr Martin Critchley)

14.00-14.30 **John Rodger MBE** (Blaenavon World Heritage Site Steering Group) 'The Blaenavon Industrial Landscape World Heritage Site: Industrial Heritage a Catalyst for Community Regeneration'.
14.30-15.00 **Antonio Ángel Pérez** (Colectivo Proyecto Arrayanes): 'The Industrial Monuments of Linares, Andalucía, Spain as Tourism Assets'.
15.00-15.30 **Dr Sharron P. Schwartz** (University of South Wales), "'Pastes" en el Pueblo Magico: Developing the Transnational Industrial Heritage of Real del Monte and Pachuca, Mexico'.

15.30-16.00 Coffee

Session 4: The Challenges of Developing Post Industrial Landscapes (Chair, Professor Huw Bowen)

16.00-16.30 **Dr Thomas Panagopoulos** (University of Algarve): 'Post Industrial Landscape Redevelopment in Southern Portugal'.
16.30-17.00 **Professor Marek Lorenc** (Wrocław University of Environmental and Life Sciences): 'The Coal Mining Region of Lower Silesia, Poland: A Blight on the Landscape or Tourism Opportunity?'.
17.00-17.30 **Chiara Baldanzi** (Montecatini Val di Cecina Mining Museum): 'Establishing sustainable mining heritage tourism in the Collina Metallifera, Tuscany, Italy: the challenges of post-industrialism'.

19.00 Introduction (by **Stephen Hughes**, Metal Links Project Director) of Special Guest Speaker, **Professor Marilyn Palmer** (President of the Association For Industrial Archaeology): 'Industrial Landscapes and Heritage in a Global Context'

Followed by Dinner in the Ballroom and Traditional Irish Music at 8:00pm

DAY 2: Saturday 19th October

Session 5: The Current State of Industrial Heritage in Ireland (Chair: Fred Hamond)

9.30-10.00 **Dr Colin Rynne** (University College Cork) 'The development of the study of industrial archaeology in Ireland'.
10.00-10.30 **Jacqui Donnelly** (Architectural Conservation Advisor, Department of Arts, Heritage & the Gaeltacht) 'Statutory Protection for Ireland's Industrial Built Heritage'.
10.30-11.00 **Mary McMahan** (President of the Industrial Heritage National Scientific Committee, ICOMOS Ireland), 'The Dublin Principles: ICOMOS – Conservation, Education, and Training'.

11.00-11.30 Coffee

Session 6: Promoting Industrial Heritage in Ireland (Chair: Deirdre Burns)

11.30-12.00 **Michael Starrett** (CEO, The Heritage Council), 'Ireland's Industrial Heritage – An Untapped Resource'.
12.00-12.30 **Dr Martin Critchley** (Mining Heritage Trust of Ireland), 'Ireland's Mining Landscapes as Cultural Tourism Assets'.
12.30-13.00 **Fred Hamond** (Industrial Heritage Consultant) 'Ireland's Industrial Heritage: Where Now?'

13.00-14.00 Luncheon

Session 7: Presenting and Marketing Irish Industrial Heritage: Issues and Challenges (Chair: Colm Murray)

14.00-14.20 Glengowla Mine, Co. Galway- **Keith Geoghan** (Managing Director)
14.20-14.40 Copper Coast Geopark – **Joe Greene** (Metal Links Project Manager)
14.40-15.00 Arigna Mining Experience - **Speaker TBA**
15.00-15.20 Guinness Storehouse – **Eibhlin Roche** (Archives Manager)
15.20-15.40 Glens of Lead Project - **Joan Kavanagh** (Steering Group Member)

15.40-16.00 Coffee

16.00-17.00 Plenary Session (Chair, **Dr Sharron P. Schwartz**)

17.00-17.15 Closing Remarks by **Councillor Pat Casey**, Chairperson of the Glens of Lead Project.



NOTICE: Broadening the Bronze Age: Parys Mountain and Great Orme, Wales, MHTI Overseas trip for 2013, Friday 27th-Sunday 29th September

Following a consensus at this year's AGM that we must try and arrange one overseas trip each year, and building on last year's field trip to West Cork to see some of the Bronze Age workings discovered there, it has been decided to visit neighbouring Wales in order to further explore the prehistoric world of mining. To this end we have lined up an exciting itinerary of field events both above and below ground with our Welsh friends and colleagues, and MHTI members working in

this subject area, to place Irish Bronze Age mining in a broader pan-European context.

Our first visit will be to Mynydd Parys (Parys Mountain), Anglesey, that was mined for copper ore in the early Bronze Age, as shown by sub-surface debris nearly 4,000 years old, revealed during excavations in 2002. Since then, access has been regained to the sealed underground workings of the Parys Mine, revealing further evidence of ancient mining. Parys Mountain is thus one of the few sites in Britain where there is evidence for the prehistoric beginnings of the British metal mining industry. David Jenkins, indefatigable mine explorer and member of the Parys Underground Group (PUG), will give us a fascinating insight into the Bronze Age discoveries made at Mynydd Parys via an illustrated presentation. Following this, there will be the opportunity of participating in a guided extreme and wet through trip with a PUG guide from the Mona Mine to Parys Mountain, taking in the Bronze Age workings (no SRT). If you don't fancy this then there will be a gentler underground guided tour with a PUG guide that also enables a visit to the in situ Bronze Age archaeology. We will also have the chance to visit the new Copper Kingdom Heritage Centre, an innovative visitor experience built into the old C19th ore bins on the quay at Amlwch harbour which contains examples of some of the Bronze Age tools discovered at Mynydd Parys. There will also be time to marvel at the reconstructed chimney at the Pearl Engine House, the new bridge traversing the arête between Mona Mine and Parys Mountain Mine, and the consolidation works undertaken at the mine windmill, intended for use as an all weather shelter with interpretation panels.

The following day, we will visit Llandudno, Conwy. A scheme to develop an area of Orme's Head in 1987 resulted in one of the most astounding archaeological discoveries of recent times: the largest Prehistoric mine so far discovered in the world dating back 4,000 years to the Bronze Age. A visitor centre has been developed which displays some of the original 4,000 year old artefacts and a selection of Bronze Age mining tools. The workings have been made accessible to the public via a guided tour, the highlight of which is the amazing Bronze Age Cavern, dug out over 3,500 years ago by miners using nothing more than stone and bone tools. One of our members, Alan Williams, is undertaking cutting edge research into ancient mining, mineralogy and metallurgy at Orme's Head (and elsewhere) and he is kindly going to share first hand knowledge of the Orme's Head mine workings, placing this within a broader Pan-European context via an illustrated talk. This will be followed by a guided tour of the ancient workings with pioneer mine explorer, Edric Roberts. There might also be the possibility of exploring some of the nearby workings not under the management of the Great Orme Ancient Mines with the Orme's Head Exploration Group. This will require SRT skills.

The draft itinerary is as follows:

Friday 27th September

Take ferry to Holyhead (either Irish Ferries from Dublin at 8:05 or 14:10 or Stena from Dublin at 08:20 or 15:10)

Stay probably at Eryl Môr hotel in Bangor – to be confirmed. Alternatives are being investigated but it is the responsibility of attendees to make their own accommodation arrangements.

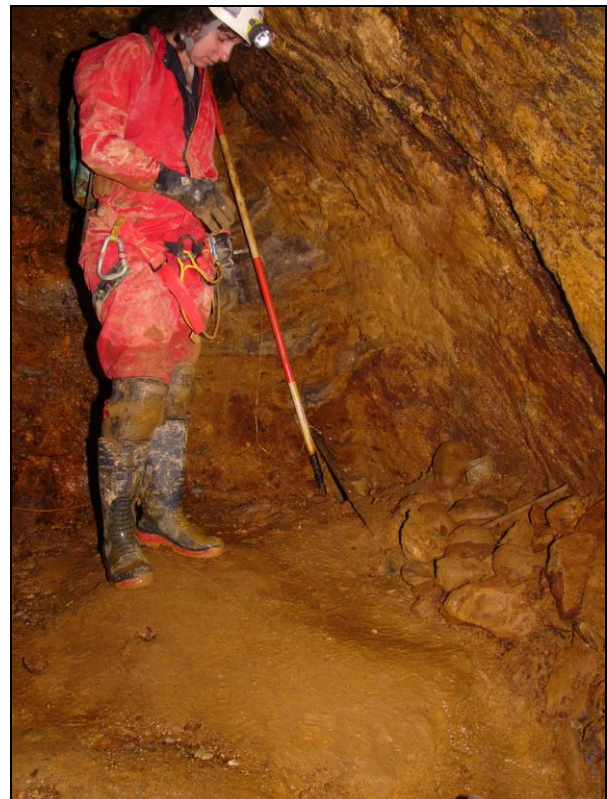
Saturday 28th September

Travel to Copper Centre in Amlwch on Anglesey

Talk by David Jenkins on Parys Mountain mines – to be confirmed

Surface and optional underground trips (easy and hard options) at Parys Mountain mine

Travel back to hotel



Parys Mountain Mine Bronze Age Stone Hammers



Ormes Head Bronze Age Mine

Sunday 29th September

Travel to Ormes Head

Talk by Alan Williams "The Great Orme Bronze Age Copper mine: Linking ore to metal"

Guided visit to the Bronze Age tourist mine (easy)

Possible optional visit to adjacent C19th and Bronze Age underground workings (requires SRT/technical access)

Return to Holyhead for Ferry (either Irish Ferries at 17:50 or Stena at 20:30)

Due to the high cost of taking a car on the ferry then we would recommend car sharing. It is also possible to travel on the ferry as a foot passenger and hire a car in Holyhead. Another option is a Ryanair flight to Liverpool and car hire.

This is the first of what will hopefully become an annual MHTI fieldtrip to visit mining heritage sites overseas. Please do come along to support this new initiative and to learn about the cutting edge research being undertaken by MHTI members in this fascinating field!

Contact Martin Critchley - email mcritchley@era.ie mobile 087-8146956 - to confirm your attendance and/or to answer any queries you may have. Please note that you will need to have a BCA insurance card for the trip. We look forward to seeing you!

REPORT: MHTI AVOCA MINES INVENTORY FIELDTRIP SAT/SUN 8-9 JUNE

A small but enthusiastic group of MHTI members turned up at the meeting of the waters on Saturday. Bright sunshine only served to enhance this stunning mining landscape and confirm the view of W. W. Smyth 160 years earlier when he wrote: "*There is perhaps no tract in these islands which exhibits, even to the eye of the uninitiated an appearance so strongly stamped with the characteristic of the presence of metallic minerals*"

Ballymoneen in West Avoca was our first stop where the Engine House and Stack were surveyed. The site is in a very poor state, with ivy reclaiming the remaining wing walls of the house and much of the stack. Movement of mine spoil and dumping of farmyard waste in the vicinity of the engine house is also taking place. Due to dense undergrowth it was not possible to establish the condition of the engine shaft. Ballymoneen was an all enclosed engine (Brown) and is unique in that the stack is attached centrally to the rear wall of the house. The condition of the house and the site has seriously deteriorated in the past decade and requires urgent attention.

The next stop was at Cronebane in East Avoca. The remains of Cronebane Count House, a long building

known locally as Magpie House was examined. While the building is in a ruinous state the find of the day turned out to be a granite post engraved with the letters AIM Co. (18th century Associated Irish Mine Company). The dating of the stone is uncertain as the AIM Co worked in the late C18th but the name was revived in the mid-C19th when the Cronebane mine became operationally separated from the Tigroney mine. The last site visited was a mine dump site of unknown date but possibly 18th century. We were unwilling to disturb the site as it will require a proper archaeological investigation to fully evaluate it.

On Sunday morning our group went to Shroughmore Townland in East Avoca. Initially we looked at the collapsed portal of a 19th century adit, intended to dewater Connary Mine. It was, unfortunately, never completed for financial reasons. We then looked at the remains of an endless Ropeway system which was built in the late 19th century in another attempt to provide power to pump the mine at Connary. The substantial remains of a leat, running from the Avonmore River, and the possible location of a wheel pit which drove the endless ropeway were examined and discussed.

An unsuccessful attempt to locate the adit where it is reported that thirteen Swedish miners were buried alive while attempting to drive a deep level into Connary in the late 18th century. The group continued up the hillside looking at the five remaining rope supports, finally arriving at the mine site. It was obvious to those lucky enough to be present on the weekend that there is still a significant amount of work required to complete the assessment of East Avoca in particular and the Avoca area in general.

Nick Coy

NOTICE: The Avoca Mines Heritage Week Walk - Sunday 18th Aug 2013

Meet at White Bridge Tigroney, which is about half way between the Meeting of the Waters and Avoca Village. (The location will be signposted) This is the annual walk which has taken place each year since the inception of National Heritage Week over twenty years ago.

The walk, which is suitable for all ages, is over safe and solid ground, but is, unfortunately, not wheelchair friendly. Visitors will hear about the social and mining history of the Avoca valley and see a range of mining and other features that are unique to Avoca. If you only ever visit one old mine site in Ireland then it should be Avoca. After all Mr Smyth says that "there is perhaps no tract in these islands which exhibits, even to the eye of the uninitiated, an appearance so strongly stamped with the characteristic of the presence of metallic minerals" And Mr Smyth knows his mines! The walk starts at 3.00 pm at White Bridge. Suitable footwear and raingear advised. Further information from Nick Coy 087 7375452 or nickcoy@eircom.net.

NAMHO 2013 conference Report

The NAMHO 2013 conference was held at the University of Aberystwyth, Wales on 28th June to 1st July. The programme was expertly organised by Peter Cloughton (MHTI member) assisted by Catherine Mills and the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) Metal Links Project. Surface field trips were organised by the RCAHMW whilst underground trips were arranged by Roy Fellows. Roy is to be congratulated for his efforts (despite access problems) and he has just secured surface and underground ownership of the Cwmystwyth mines for the Cambrian Mines Trust (hopefully securing access to these workings for future generations). A number of MHTI members attended the event and a presentation was made by Martin Critchley and Sharron Schwartz on the current state and conservation issues of the Glendalough mines, Co. Wicklow. John Morris also presented work that he has been doing on a Bargain Book from the Minera Mine in Wales. NAMHO 2014 is tentatively planned to be held in North Wales and the MHTI has offered to hold NAMHO 2016 in Ireland.

Martin Critchley

REPEAT EVENT NOTICES FROM NEWSLETTER 60

Ballinarry Parish Gathering 26th – 28th July 2013

This includes an exhibition in the local coal mining museum. For more information e-mail ballinarryparishgathering@gmail.com
<http://www.thegatheringireland.com/>

Dig Deep Castlecomer Underground 2nd – 5th August 2013

A community celebration of the unique history of Castlecomer, its Coal Mining heritage and the many community groups and clubs which make Castlecomer what it is. The event will start with a community barbeque, where former miners and their families from overseas will be the guests of honour, a variety of sporting and cultural events, including tours of the former mines and local bog, mass of remembrance at the old Pit Head, unveiling of plaque to those who lost their lives in the mines, ceile in the community hall and a unique exhibition of colum dancing are organised to take place over the period of the festival with a gala event to close. For more information phone 087 697 9264. <http://www.thegatheringireland.com/>

Allihies Connects 12th – 15th September 2013

Allihies is welcoming the copper-mining diaspora home! We are calling these people to come to Allihies and celebrate our connections and Heritage. To breathe life back into the mines themselves by having a grand opening with the illumination of the main mine building, lighting of the engine-house chimney (12th) and Main Choir musical event in the underground mine (13th).

Over the course of our celebrations there will be copper smelting and casting taking place.. and the un-veiling of a plaque for the mines museum memorial garden.

Amongst other activities there will be: Genealogy Research and Clan Gathering, Fire-blowers and Theatrics, Childrens re-enactment performance/play, Irish dancing, Bodhran players, Story-telling, Guided tours of the mines, Harvest market... and much more. For more information phone 027 73218. <http://www.thegatheringireland.com/>

NEWS: IRISH NEWS/ISSUES/BOOKS

Slieveardagh, Ladyswell Barytes and Allihies

The following has been forwarded from member Colin Wilson re Slieveardagh, Ladyswell Barytes and Allihies. These will be placed in the MHTI Archive.

Newsletter Number 56, June 2012 noted that there is a Slieveardagh Mining Heritage Group, Colin writes. My father was involved with Slieveardagh from 1947 until the State's interest was sold to Tom O'Brien in 1953. I have collected a fair bit of information about mining in the coalfield and I have started a list of what I have, to pass on to MHTI in due course.

Colin has also passed on two lots of documents relating to Ladyswell barytes mine which he received from ex-manager Mike Clesham. The first, reproduced here shows an orderly closure of the mine, what plans survived and what was not known.



Colin Wilson took this in Allihies on 3rd Aug. 1963 of what looks like miners' living quarters. The sign in the middle reads "Emerald Isle Mining Co. Ltd, subsidiary of Can-Erin Mines Inc., Toronto Canada." That phase of operations, when the old mine was pumped out, had ended about eighteen months previously.

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30th July, 1982.

From: Mr. James N. Sinclair,
Senior Industrial Inspector,
(Mines and Quarries),
Industrial Inspectorate,
Department of Labour,
Mespil Road,
DUBLIN, 4.

Re: Closure of Ladyswell Mine.

Dear Mr. Sinclair,

Thank you for your letter of 16th July, 1982, and your remarks which are appreciated.

I am enclosing, by registered post, the relevant documents and information that are required by you on the closing of the Mine.

1. Plans and Sections:-

Plan and Longitudinal Section of	300 L. West.
" " " "	300/360 L. East and West.
" " " "	410 L. East.
" " " "	410 L. West and W3 Ramp Layout.
" " " "	410 L. West.
" " " "	460 L. West.

(No development undertaken on East side.)

Plan and Longitudinal Section of	510 L. East.
" " " "	510 L. West.
" " " "	560 L. West.

(No Development undertaken on East side).

Longitudinal Layout Section East and West of all levels from 300 level to 710 Level worked are as shown coloured.

There are no plans or sections of the old workings emanating from 60L., 120L., 180L., or 240L.

The 60L., 120L., and 180L. cannot be entered from the Main Shaft, being inaccessible because of debris.

The 240 L. is accessible by a short X/cut from the shaft on the south side, and at one time was used by us as a tandem pumping stage.

The drives East and West of the X/cut are inaccessible.

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The other is headed Interoffice Memorandum 1st Sept. 1980 from manager Mike Clesham on Subject "Benefits to Houston Payroll Staff employed at Lady's Well" and suggests that when it comes to local staff "that some employees are more equal than others".

Ordnance Survey Memoirs

Ordnance Survey Memoirs were written in the period 1830-1840 for parishes mainly in Ulster, and they can contain useful information on mining and quarrying, and much else of interest. Four volumes have just been republished by the Ulster Historical Foundation including Vol. 20: Parishes of Co. Tyrone II – Mid and East Tyrone, and Vol. 40: Counties of South Ulster – Cavan, Leitrim, Louth, Monaghan and Sligo.

<http://www.booksireland.org.uk/store/ordnance-survey-memoirs>

Additions to Bibliography:

Flanagan, Patrick, 1972. Some notes on Leitrim industry. Breifne, Vol. 4, No. 15, p406-425. (Journal of Cumann Seachais Bhreifne / Breifne historical Society) 12 pages about mineral products and mining.

Gwyn, David., 1991. Valentia Slate Slab Quarry. Journal of the Kerry Archaeological & Historical Society, No. 24, p40-57.

Pettit, Tom, 1958. Barytes Pot, Gleniff. Journal of the Craven Pothole Club, Vol. 2, p212-216, 2 plates. An account of exploration for caves, but gives a little contemporary information about Benbulbin Barytes Mine.

Research note on the Sroughmore-Connary endless wire rope system

Following an excellent day in the field with Nick Coy and several other colleagues as part of the Avoca site inventory, I was intrigued about the endless wire rope system erected at Sroughmore. I consequently dug into my files and can offer the following additional information.

A weir was created across the Avonmore to damn the water that was conducted in a wide concrete leat to power a turbine capable of generating over 80hp. This turbine provided the energy to drive an endless wire rope system erected by the Ovoca Mineral Company Ltd. in the early 1880s to pump water from Connary Engine Shaft. It was not a success, but the extant remains of what was a unique system in Ireland are quite impressive.

I was intrigued as to why such an unusual system was used, instead of the more conventional waterwheel and flat rods system. We can only speculate that flat rods were not practical as they would have had to operate up a steep hillside for a distance of well over a kilometre that would have resulted in considerable loss of power, plus they were high maintenance and very expensive to buy and install. A wire rope would have been far cheaper to purchase. In addition, conventional waterwheels are basically slow moving, often need to be of massive construction and are highly stressed; they are thus in need of constant repair and maintenance. Moreover, there is also a limit to the head of water that can be effectively utilised, which would certainly have been a factor down at Sroughmore where there is no significant drop in the land elevation to obtain sufficient head to power a wheel. A turbine would have been smaller, able to run at a greater speed and had the added bonus in that it could be fully immersed in water.

We have yet to discover what type of turbine it was, but they are usually of 2 types: reaction and impulse. In a reaction turbine all the water passages are completely filled; the energy stored in the water at the inlet of the turbine is transferred to the wheel or runner as it passes through the machine, which acts under pressure and can be fully immersed in water. In an impulse turbine, water is directed on to the wheel from one or more jets, so the water is delivered at a velocity due to its head. The rotor loses power if the tailrace water touches it. It could not have been a Pelton wheel as these only came in after 1890.

Sharron Schwartz



MRes Irish Local History

Queens University Belfast is introducing a Masters degree by research into Irish local history. The part-time or full-time degree includes training courses and is aimed at people who want to carry out a major research project.

<http://www.qub.ac.uk/schools/SchoolofHistoryandAnthropology/ProspectiveStudents/PostgraduateMADegrees/MResIrishLocalHistory/>

Request for tender: Panoramic tour of Tankardstown Mine

Copper Coast Geopark Ltd are inviting tenders for the production of a panoramic film and fly-through of surface buildings and underground workings at Tankardstown Mine.

<http://irl.eu-supply.com/app/rfq/publicpurchase.asp?PID=67944>

Mine Rescue Competition 2013

The 2013 All Ireland and the UK Competition took place at Tara Mine on the 17-18 May. Teams from Kilroot, Lisheen and Tara in Ireland and teams from Boulby and Winsford in England competed with Galistar, a team with members from Galmoy, Lisheen and Tara. The team from Tara won most of the competitions and was declared the Best Overall Mine Rescue Team.

<http://www.imqs.ie/NewsEventsViewer/tabid/93/ArticleId/460/Mine-Rescue-Competition-2013.aspx>

Mineral Resources Map of Northern Ireland

Six 1:100 000 scale maps cover the Province on a county-basis. They include information on geology, construction materials, metalliferous minerals, energy resources, planning permissions and administrative designations.

<http://www.bgs.ac.uk/mineralsuk/planning/resource.html>

FEATURE: Cerro Rico de Potosí: ‘The Mountain That Eats Men’

Cerro Rico (Rich Mountain) looms large over the narrow cobbled streets of the city to which it gave birth: Potosí at the southern end of the Bolivian Altiplano. At 4,090 metres, it is the highest mining city in the world. The silver lodes of Cerro Rico had been worked from Pre-Incan times, but were exploited on a grand scale by the Spanish Conquistadores making the mines of Potosí world famous. Indeed, novelist, Miguel de Cervantes, placed the words, *Vale un Potosí* (It is worth a Potosí), into the mouth of his hero, Don Quixote. The ore derived from these mines bankrolled the Hapsburg Empire for centuries, exciting the envy and suspicion of all other monarchs in Europe. It was said that you could have built a bridge of silver ingots from Potosí to Madrid from the ore mined there. Just over a century after the Spanish arrived, Potosí had mushroomed into one of the biggest cities in Latin America and was among the wealthiest in the world. But this meteoric rise came at a huge cost to human life. Cerro Rico can be seen as a 4,824 metre monument to the tragedy of Spanish conquest. And Potosí, now a World Heritage Site (WHS) boasting a number of ornate Baroque churches, a virtually intact mint and opulent colonial buildings, was formerly described as ‘a monstrous Babylon’ that represented the largest site of physical exploitation in the world during the colonial period (1546-1825). Countless indigenous men from across the Andes were press-ganged by the Spanish into servitude to work the mines under the Pre-Colombian *mita* system. Alongside black African slaves, the *miteros* toiled in the most appalling and dangerous conditions, often sleeping underground for weeks on end. Many never saw their homes or families again, killed in the mines, literally worked to

death or poisoned by the toxic effects of mercury used on the *patio* (ore processing) floors. Although, unsurprisingly, records of fatalities were not kept, it is estimated that over eight million mineworkers perished in Potosí during colonial times. Consequently, it was also said that a road comprised of the bones of these hapless victims of colonial cupidity could have been built from Cerro Rico, ‘the mountain that eats men’, to Madrid.

By the early nineteenth century, the output of the Cerro de Potosí began to significantly decline as the silver deposits worked in the rich oxidised zones in the upper part of the mountain were mostly worked out. Compounded by looting during the 1820s Wars of Independence, Potosí’s star began to wane. However, deeper tin lodes (along with other base minerals such as zinc, lead and cadmium) were being mined in the Cerro de Potosí by the twentieth century, supplanting silver. In the 1930’s, a reaction set in towards the ‘tin barons’ that controlled the majority of Bolivia’s mines and were perceived to have established a stranglehold

on national politics and to be exploiting the indigenous people; groups of workers banded together to fight for more autonomy. The tin barons were eventually marginalized by the industry’s nationalisation of the mining sector and the emergence of the Bolivian Mining Corporation (COMIBOL) following the revolution of 1952.



Cerro Rico towers ominously above the City of Potosí

In the aftermath of the collapse of the tin market in 1985, emergency economic measures by the government resulted in massive layoffs of miners and considerable restructuring of the mining sector, including the decentralisation of COMIBOL into five semiautonomous and privatised mining enterprises in 1986. The vast majority of mineworkers were left to survive on their own with no state or foreign investment. They formed cooperatives which function under an informal labour system where the product of one’s labour accrues to the group’s total output in exchange for a share of the market value of the minerals extracted once operating costs and other deductions have been made. The ore is concentrated in local mills to which each co-operative pays a fee, and then sold in tonnes to privately operated smelters. COMIBOL still owns Cerro Rico but licenses its operation to a handful of multinationals and over 200 cooperatives who pay to rent an area of the mountain in which they have been granted permission to work. The rise in mineral prices in recent years has witnessed a recovery and expansion of the mining sector. Over 16,000 miners are presently estimated to be at work in the mines of Potosí, most working in cooperatives primarily extracting low grade silver bearing ore from the old workings in Cerro Rico, which is becoming dangerously unstable...

The Miners’ Market

Attracted by its remarkable history, Martin Critchley and I made the journey to Potosí in April of this year. We arrived on the outskirts of the city just as the first light of dawn began to radiate across the bare and barren hillsides, lending them warm tones of ochre,

magenta and sienna. Although it has been a WHS since 1985, to suggest that Potosí possesses a charm comparable to other WHS cities in the Andes is stretching the imagination somewhat. It is bitterly cold at night and the altitude means you fight for every breath walking up its steep cobbled streets, choked by sooty clouds of cheap petrol fumes from the incessant traffic and the unavoidable inhalation of the beige haze of fine mineral dust that seems to seep into every nook and cranny. Many parts of the city are gritty working neighbourhoods and numerous buildings in the historic centre look decidedly down at heel; an atmosphere of quiet neglect appears to have settled over the streets along with the fuel soot and mineral dust.

Guidebooks advertise half day guided mining tours into Cerro Rico and there are many operators in Potosí to choose from, all of which have agreements with various cooperatives to permit tourists to enter their workings. We used *Koala Tours* who charged us ten US dollars each for a trip into Mina Candelaria (Candlemas Mine, after the famous February Catholic fiesta). Kitted out with well-worn protective overalls, a helmet, battery powered cap lamp, wellies and colourful bandanas at the company's base, eight of us set off for the Cerro early one morning. Our minibus groaned sluggishly up a maze of narrow streets, spewing clouds of black fumes before entering a bustling square where it shuddered to a halt. At its centre was a huge rocky mound at the base of which was a grilled adit entrance with a mine wagon behind it. Atop this mound, supposedly meant to represent Cerro Rico, was a gleaming golden figure of a miner holding a pneumatic drill in one hand and a gun aloft in the other; it spoke volumes about Bolivian history! My eye then caught another resplendent figure kneeling below, a *chola* woman, complete with characteristic full skirts and bowler hat, brandishing a small hammer in her right hand and a rock in her left. She is one of the *palliris*, female ore-breakers who fossick through the unstable mine dumps of Cerro Rico, work that is not without danger, to grub an informal living to help maintain their families. A reminder that the women of Potosí can also fall victim to 'the mountain that eats men'.

We then walked up a steep street towards the Miners' Market which was thronged with squatting vendors hawking goods from hand carts and fast food stalls feeding ravenous groups of miners just off-shift. We passed scores of shops little more than holes in the wall, their contents spilling out onto the narrow pavements. Peering into their dimly lit interiors we could see that these were mining stores. The rickety shelves were crammed floor to ceiling with everything a miner requires: overalls, gloves, masks, wellies, helmets, lamps, battery packs, drill steels, picks, hammers, bottled water, fizzy drinks and plastic bottles filled with *alcohol potable* (neat alcohol made from cane sugar). Amid the clutter on the floor of one store were bulging plastic bags filled with light pink grains



Statue of a Chola Woman, a reminder that females constitute an important part of the mining labour force in Potosí

marked 'ANFO'. Surely not ammonium nitrate, widely used as a bulk explosive?! I stood in mild bewilderment as my eyes alighted on an open box containing sticks of dynamite. 'Go inside', smiled our guide, 'you have to buy some gifts to give to the miners we will meet on our tour'. I still find it hard to believe that high explosives are stored so casually in the scores of shops lining this street and are sold to anyone, no licence required, no questions asked. Along with bottles of water and fizzy drinks, we purchased two explosive kits, each containing a small plastic bag of ANFO, a stick of dynamite and a coil of safety fuse for the princely sum of 17 Bolivianos (about 1.50 euro) each! Almost opposite the mining store, next to a *chola* woman busily hacking the head off an alpaca's carcass, was a coca leaf seller, prematurely aged, the harshness of life on the Altiplano etched into the thousands of lines on her brown and wizened face. 'First explosives, now drugs', I thought! The guide explained that the miners do not eat underground, but rely on the stimulating effects of chewing coca leaves to dull their hunger and stave off fatigue during their arduous 10 hour plus shifts. We bought a couple of bags of the pale green, strong smelling leaves, drawing an almost toothless smile from the vendor.



Typical miners' store in the market. Note the bags of ANFO!

The Rape of 'Mother Earth'

After a short journey out of the city we stopped outside a series of crude hutches above one of around 39 ore treatment plants dotted about the mountainside. In these hutches, a cooperative's ore is stored and assayed before being processed so the group can receive its fair share of the price of the concentrate. The mill was truly primitive, very noisy and fummy, yet the workers wore no protective equipment. Our guide explained that the ore is processed with various chemicals and reagents to separate the silver, casually waving his hand at an open vat of cyanide nearby: 'it used to be worse when mercury was used!' Several of our group looked horrified and promptly covered their faces with their bandanas! The ore is reduced in ball mills then treated in froth flotation cells. Base minerals occurring with the silver ore, such as lead and zinc, were previously discarded as it was not considered commercially viable to extract them. But rising mineral prices has resulted in an increased recovery of all minerals. We suspect that the untreated effluent from this mill eventually discharged into a local river system...

Behind the processing plant, Cerro Rico rose against the deep blue sky of the Altiplano like a giant ochre-coloured anthill. It contains more than 650 separate entrances and is literally honeycombed with hundreds of thousands of tunnels that follow increasingly impoverished mineral veins. With limited state regulation and little concern for safety, the mine workings are randomly driven and the whole mountain is now believed to be inherently unsafe; catastrophic collapses are predicted. Indeed, all mining near the peak was suspended in 2009 after the ground there began to subside. Over 500 years of mineral extraction has already decreased the mountain's height significantly. This epitomises the rape of 'Mother Earth' and on a grand scale, for in indigenous Andean culture, Cerro Rico is adjudged to be female and mountains represent Pachamama, 'the Mother Earth'. This fact was quickly understood by the conquering Spaniards who ensured that she became synonymous with the Virgin Mary to convert the indigenous peoples to Catholicism. This association is especially evident in

Potosí's most famous painting on display in the Royal Mint - the anonymous eighteenth century *La Virgen del Cerro* - where the Virgin Mary is portrayed as the mountain of Cerro Rico.

Cooperative mineworkers can earn three to five times the amount of money made by those in menial service jobs or agriculture, although by western standards their wages are still pitifully low. Moreover, they are not immune to exploitation and many complain that the managers take the lion's share of the collective income leaving them with barely enough money to get by on each month. But with Potosí being the poorest state in the poorest country in South America, mining is the area's lifeblood. The costs to human health or the environment are far outweighed by the driving need to feed large families. More than half of the 240,000 residents residing in the city whose dusty houses creep towards the mountainside as if lured by an invisible magnetic force, depend directly on the mines for their livelihoods. It is not hard to see why *Potosinos* have good reason to thank Pachamama, making daily libations to her for the gifts she has bestowed on Cerro Rico...

Mina Candelaria

Our minibus continued ever higher up the mountainside, lurching over rutted tracks and throwing up clouds of ochre coloured dust, eventually arriving outside the ramshackle entrance to Mina Candelaria, over 4,500 metres above sea level. Possessing four levels and running continuously for over 300 years, it is one of the oldest mines in the Cerro. Crudely built stone buildings half set in the ground with roofs of galvanized iron and plastic sheeting held down by rocks and bits of old machinery, cluster around the mine's main portal. An empty wagon rumbled by on a tramway to the entrance portal, pushed by a short, but powerfully built miner who disappeared into the darkness of Level One. We followed him in to begin our two hour tour. The portal walls were initially coated in fine dust, but as we progressed deeper into the mine, blooms of bright yellow sulphur appeared on everything. Several miners passed us on the way in to start their shift. Our guide knew them all; he had once worked here as a miner himself. Bent double in places, the high altitude immediately began to take its toll and it became harder to breathe as the temperature inside the level rose uncomfortably.

About 400 metres in and close to an ore chute encrusted with sulphur, we stopped. Our guide announced that we were going to clamber on our hands and knees over a pile of loose rock to access a short, low drive beyond. Two of our group instantly announced that they were too afraid to continue and headed back down the tunnel to the surface. Inside the hot, airless drive, gasping for breath and seeking somewhere to sit, I staggered about like a drunkard. I was suddenly aware of a figure close to me. Turning my head, my cap lamp illuminated a grotesque horned and mustached clay figure sporting an enormous erect phallus. It was seated amid a heap of empty tin cans,

plastic bottles and crumbling cigarettes, garlanded in luridly coloured paper streamers and covered in rotting coca leaves. ‘Meet El Tío, the Lord of the Underworld’, announced our guide. Just as local people make daily libations to Pachamama, the miners make offerings each Friday to El Tío (literally ‘The Uncle’), who is associated with pre-Hispanic *huacas* (revered objects) as well as the Christian Devil. He is a central figure in the ritual life of Bolivian mining communities. As there is no state enforced health and safety regimen in the mines of Cerro Rico, and cost cutting by the cooperatives sees little attempt to shore up tunnels or replace failing timberwork, the miners place their faith in Tío, presenting him with gifts of alcohol, coca leaves, cigarettes and llama blood in return for his goodwill and guarantee of health, safety and good fortune in the mines.



El Tío

Returning to the tunnel on Level One, we then began the hellish descent down through ancient workings via Level Two to Level Three. Used nowadays only as an access route for the levels above and below, the air in Level Two is foul and thick with dust. The way on involves crawling on all fours in places through tunnels barely large enough to permit an adult to pass and under rotting stulls holding up large quantities of deads. Squeezing through partially collapsed raises and shimmying down dodgy stull-work within a winze which bottoms out dangerously close to an open stope, are indelibly etched on my memory. Standing next to an old windlass above this winze, our guide explained that before an electrical winch was installed a few

years ago to raise the ore from Level Three to Level One, the miners had to carry over 40 kg of ore up through these tight rocky passageways in bags slung over their backs. By now my face was beaded with perspiration and my heart thumped incessantly against my ribcage as I fought for every breath in the impossibly hot, dry and foul air. The acrid sulphurous taste of the dust, caught in the back of my throat, made me cough till I gagged. ‘I’ve been in safer abandoned mines in Cornwall’, I thought as I clambered down another horrible raise, only to arrive on a narrow rocky shelf where I light-headedly gazed into a deep stope that promptly swallowed the light from my cap lamp. One slip here...

It was with considerable relief that I finally emerged into a tunnel in which I could stand upright. ‘This is Level Three, the “Gringo Level”’, our guide jokingly explained. A low hiss from ventilation pipes bringing clean air down from the surface filled the tunnel. It was now far easier to breathe. This was the main haulage way where ore from Level Four was raised and trammed along in wagons to be sorted before being hauled to the surface. We followed the tram tracks for some distance before ascending a short ladderway into a rock strewn drive. A hammering sound greeted us and in the gloom a miner appeared at the forehead. Alone in this airless drive, one cheek bulging with a wad of coca leaves and drenched in perspiration, he was single jacking a bore hole with a drill steel for an explosive charge. It was like a scene straight out of the nineteenth century.



Miner single jacking. Note his cheek bulging with coca leaves.

I confess to being moved as I shook this man’s hand and gave him our gifts of explosives and coca leaves. We then returned to the main haulage way where several men passed us, straining to push heavily laden wagons of ore which constantly jumped the tracks. Some were evidently not long out of childhood. They were conveying the ore to their colleagues who were shovelling it into rubber kibbles to be hauled up a shaft by the electric winch. Most were working, red eyed, amid clouds of choking dust without masks. It unsettled me to think that these young men, who stopped work to greet us and humbly accepted our gifts

of coca leaves, fizzy drinks and water, are unlikely to reach middle age.

We were not taken to Level Four, currently the main work area, where the horrors of the working conditions

may be left to the imagination. The climb back up through the old men's workings of Level Two was even more arduous, stifling and airless than the descent and I was mightily relieved to see the bright pin point of light of the entrance portal appear in the reeking sulphurous darkness. Cerro Rico is no model of operational safety and its mineworkers toil in shocking conditions that lag way behind the rest of the world. And this mountain is still eating men. On average, life expectancy among the miners is less than forty years and several men die each week from silicosis or through mining related accidents. Countless women in Potosí are widows or widows in waiting and most face

an uncertain future of bringing up large families on their own. However, it might be somewhat disingenuous to see these men and their families purely as victims. They value their independence, are proud of their work in the mines and receive better pay for their efforts than they could obtain if employed in menial jobs outside the mining sector. I do, however, question the wisdom of allowing hundreds of tourists each day to enter workings that are unregulated, inherently unsafe and, quite frankly, a death trap. Given that the current high price of minerals has stimulated mining activity and the fact that the whole of Cerro Rico has been rendered so fragile and unstable because it is literally riddled with mine workings, 'the mountain that eats men' could soon find itself feasting on unsuspecting tourists.

Sharron P. Schwartz

OTHER NEWS

George Hall RIP

The Secretary of the Welsh Mines Society (David Roe) has informed the mining heritage community that George Hall, one of the founding fathers of the WMS, and all round wonderful person, died on Sunday after a short illness. George was well known for his expertise and knowledge of the metal mines of Wales and published a number of books including "The Gold Mines of Merioneth" and "Metal Mines of South Wales". George was also a practical miner, operating his own lead mine and mill in mid-Wales in the 1940's and 1970's. He was always generous with his time and willing to share his information with others. His knowledge of the contents of the Mining Journal; especially with reference to Wales was legendary as was his hand written index.

Martin Critchley

Hatfield Colliery, South Yorkshire (14/02/2013)

A massive collapse of a spoil heap at Hatfield Colliery has bucked neighbouring railway lines, disrupting services between Doncaster, Scunthorpe and Cleethorpes. About 1000 000m³ of spoil will need to be moved to stabilise the area. Network Rail hope to have rail services restored by July and the track repaired by September. Hatfield Colliery is managed by Hargreaves Services PLC for its owner ING.

Alkane Energy PLC (25/03/2013)

The company are now the largest Coal Mine Methane (CMM) operator in the UK following its acquisition of Greenpark, operating across 16 sites with a licence area of 800 km². Last year it developed a new site at Gedling Colliery in Nottinghamshire and recommissioned a site at

Askern Colliery in South Yorkshire. During 2013 the company plans to develop a new CMM site at Pontycymer in South Wales. Further information is in the company's Annual Report.

<http://www.alkane.co.uk/>

Marine Minerals Ltd, Cornwall (25/04/2013)

Marine Minerals is aiming to recover tin from the seabed off the coast of North Cornwall. It carried out survey work in February to establish the tin content of sediments between St Ives and Perranporth. The company has now started a year-long, £500 000 study which will form part of an Environmental Impact Assessment to accompany a future licence application.

<http://marine-minerals.com/latestnews.html>

Wolf Minerals Ltd, Plymouth, Devon (29/04/2013)

GR Engineering Services have been conditionally awarded a £75M contract to design construct and commission a tungsten & tin mineral processing plant and associated infrastructure. Wolf are recruiting a Process Plant Manager initially to assist in the development of the plant.

<http://www.wolfminerals.com.au/asx-announcements/quarterly-reports>

Proposed surface mine, Midlothian (02/04/2013)

Scottish Coal has applied for planning permission to develop a surface mine at Cauldhall Moor, east of Penicuik in Midlothian. The company want to extract 10 Mt of coal and 100 000 t of fireclay over a 10 year period. The development

could create 230 new jobs. Planning application reference 13/00105/DPP

http://www.midlothian.gov.uk/info/1210/planning_and_the_environment

<http://www.agg-net.com/news/cauldhall-surface-mine-proposal>

Bingham Canyon Mine, Utah, USA (10/04/2013)

A major slide affected the north wall of the open-pit copper mine on 10 April. The event had been anticipated and no people were injured, although about 10% of the shovels and haul trucks have sustained damage. Using laser scanners the weight of the displaced rock is estimated at 165 million tons. Kennecott Utah Copper have resumed limited mining operations and sent the first new ore to the concentrator. The open pit is ¾ mile deep. In its 109 year history the mine has produced 19 million tons of copper.

<http://www.kennecott.com/slideupdates/first-new-ore-mined-and-delivered-concentrator>

Proposed surface mine, Northumberland, 12/04/2013

Northumberland County Council has granted planning permission for the proposed Ferneybeds Surface Mine. Banks Mining will extract 752 000 t of coal over a three year period creating 40 jobs. The company also hopes to extend their surface mines at Shotton (SE Northumberland) and Brenkley Lane (Newcastle).

<http://www.banksgroup.co.uk/news/>

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