Message from the MTD Board Chairman

It’s Autumn already, where did the summer go? Our MTD newsletter has been going for 12 months, how time flies! From its beginnings we have been trying to improve the layout, content and encourage a range of writers, so the question is, are we getting there? Let us know what you think!

MTD is concentrating on getting our conference on track, see our advert later in the newsletter. It will be a great forum to see just how much mining does go on in the UK. You still have time to register.

Following on from our summer newsletter and how much people enjoyed reading the Owen Mihalop interview, we have another interview to interest you. Other contributions feature how UK expertise is being used overseas and on the heritage trail we have a bespoke article on Ecton Mine and our regular slot of places to visit. This time it is Llechwedd Slate Caverns.

Our new slot, and one that we will take forward in successive newsletters is to review the activities of our mining local societies. For our first try at this, we are looking at the North of England Institute of Mining and Mechanical Engineers.

Christine Blackmore
IOM3 MTD Chairman

STOP PRESS!
The MTD Conference (4 & 5 October) venue has been changed to:
Rooms on Regent’s Park, 27 Sussex Place, London, NW1 4RG
(Royal College of Obstetricians & Gynaecologists).
Nearest tube station: Baker Street.

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Interview with Richard Severn, Chief Mining Engineer, Boulby Mine.

Boulby Mine is a part of the ICL Group. Since mining started in 1973, Boulby Mine has been successfully supplying customers around the world with potash products, mined and refined on site. More recently, Boulby became the first mine in the world to mine polyhalite, a fertilizer carrying the benefits of sulphur, potassium, magnesium and calcium. Sold only by ICL as Polysulphate.

Richard, tell us a little about yourself and your role at Boulby mine?

I head up the Technical Services Departments; Survey, Geology, Rock Engineering, Planning and Ventilation. At the same time I maintain responsibility for project management, Polyhalite research and development as well as deputising for the Mine Manager.

Boulby Mine is the ‘last remaining deep mine in the UK’, is this the inevitable end of an era?

For high productivity deep coal mines, probably yes, but definitely not for industrial minerals, smaller scale coal mines and metaliferous minerals, such as tin, lithium, and wolframite.

UK is seeing an upsurge of interest in mining projects from Cornwall to the North of England and into Scotland, several of which have attracted significant investment taking them beyond feasibility and into the development stages.

As you say there’s somewhat of a mining renaissance taking shape, what more can the industry do to attract, train and develop the miners of the future?

For me it’s down to an active working relationship between Industry, Schools and Higher Education. In providing apprenticeships, internships and scholarships for under- and post-graduates with clearly defined career progression routes so companies not only attach good skills but also retain these skills.

From your personal experience, what would you be advising the emerging graduates and apprentices of today?

Make contact with mining companies through professional bodies such as IOM3 and CSMA. Of course, make use of the readily available professional networking tools such as LinkedIn.

Attend events and conferences and whilst there make the effort to introduce yourself, take the initiative. Seek work experience during your long breaks even if not directly related to mining, this still shows aptitude for work. Then, there is no better advice than studying hard to achieve the highest grades you can.
Agency Nationale Minerales visit North of England Mining Institute

Members of Colombia’s Mines Rescue Division of the national Agency Nationale Minerales recently visited the North of England Institute of Mining and Mechanical Engineers (NEIMME).

As part of a study tour conducted by the Mines Rescue Service, led by Andrew Watson, MRS Commercial and Technical Director, the delegation was invited to Neville Hall to see how mining records are kept and how they have assisted in developing safe mining techniques and the development of efficient and expert Mines Rescue Services.

The delegation was led by two female engineers; Ms Martha Lucia Muñoz González, Professional Manager Vice-Presidency of Monitoring, Control and Mining Security, Mining Safety and Rescue Group and Ms Aura Yomaira Castro Franco, Mining Engineer, who is working specifically with mines rescue. Accompanying the delegation was Mr Carlos Felipe Barrera, Managing Director - South America of the John T. Boyd Company.

The delegates were met by the Mining Institute’s President, Rick Smith and Past President, Mining Technology Board Member Norman Jackson who conducted a tour of the building with Centre Manager Simon Brooks.

In 2016, MRS Training & Rescue (Mines Rescue Service) were awarded a project to update and modernise the Colombian mines rescue service, which is part of the Agency Nationale Minerales (ANM).

ANM in Colombia are the licensing agent for mineral extraction (equivalent of the UK Coal Authority). They are also the regulator (equivalent of HSE) and provide mines rescue services. There are 7,700 known mines in Colombia with an estimated additional 30% that involve illegal mining activity. ANM are required to provide a mines rescue service to all of these mines.

The first phase of this contract was completed by the end of 2016. This included information for training comprising lesson plans and course materials. Three visits were made to Colombia which included 2 training sessions on mines rescue standards and competence assessment. Part of the materials provided were based on early National Coal Board training booklets sourced from the Mining Institute’s archives. These 1950’s training materials proved ideal as they were largely pictorial requiring little translation for the miners of Colombia.

The biggest success was the acceptance of standards to be applied to mines rescue operations.

The return visit to the UK by the delegation was made to provide evidence to the delegates of the history of the UK mines rescue service and that the standards to operate Mines Rescue safely and effectively can be achieved. The visit included underground visits, observations of mines rescue training, records, equipment maintenance and, most importantly, competence assessment.

The visit to the NEIMME was arranged with the objective of showing the Colombian delegates how the Institute maintains the historical records which can still be useful today to highlight the need for standards, both in mines and in mines rescue. Norman Jackson showed the delegates a number of mining accident reports from the early 19th to the end of the 20th century and explained how the scientific analysis of mine accident recording and reporting had contributed to the development of safety in mines and the development of the Mines Rescue Service. The delegates also enjoyed a visit inside the archive room, studying some of the earliest mining journals by John Buddle, Smiths first edition of the Geology of England and Wales and books by Nicholas Wood. Feedback from Martha and Aura suggested they were very impressed with the history and, more importantly, the information that was available at Neville Hall.

The visitors were introduced to the Professional Qualifications and advantages of IOM3 and NEIMME and provided with membership details. NEIMME was the winner of the Local Society Award for Large Societies in 2017.

Norman Jackson
MTD Board Member
UK Expertise Overseas

One of the benefits of being an old coal mining engineer is that although coal mining has all but ceased in the UK, (apologies to the current crop of developing mines!) I can still ply my trade overseas where the coal industry is thriving and is likely to be so for many years.

For my sins, after many a year and many a weekend fighting spontaneous combustion at Daw Mill and other collieries in the 80’s, I have the experience to be able to look at similar situations on behalf of insurance companies and assess whether claimed losses from spontaneous combustion are justifiable.

Detective work is always interesting and looking for the causes of a particular heating and whether the subsequent actions were acceptable turns out, often, to be less straightforward than expected.

Upper Silesia in Poland has its fair share of spontaneous combustion issues, which are compounded by the fact that most of the mines are also prone to high methane levels, the two not being good bed fellows. Most mines operate typical longwall retreat faces similar to those in the UK, but thin seam plow faces are much more common.

Polish mines are categorised for methane, methane and rock outbursts, spontaneous combustion, rock bumps and water risk. Within Upper Silesia most mines have a very high methane category risk followed closely by the spontaneous combustion risk. Often the ventilation systems used, Y systems, where the air travels to the face via both gates, the return air utilising the gateroads behind the face removing the air from the face and keeping the methane fringe well away from the face, but pushing air into the waste area. Not too bad where the face performance is good but where it is slow there is an increased risk in many seams of initiating spontaneous combustion, particularly where coal is left in the roof or floor.

Additionally, since many of the seams split and the leaves are worked separately the proximity of the leaves previously worked above a particular face is within caving distance of the lower face. Where old stoppings have either not been sealed or leak over time, air can enter the waste of the face above and either start or reactivate heatings within the old waste.

Evaluating what the mechanisms are in starting a heating and whether it could have been foreseen is often the pertinent question to insurers. Claims for methane ignitions can also be interesting. In Poland the face ‘passport’, approved prior to working, lays down what must be done to minimise any risk. One claim involved a face where methane emissions from the floor of the face were expected and in order to minimise the risk of ignition the passport stipulated compressed air should be introduced via nozzles into the bottom race of the face conveyor to dilute any gas.

A methane ignition did occur, which, from the evidence, appeared to be due to a build up of gas in the bottom race which was ignited by the face conveyor. During the investigation, no evidence could be found that the compressed air system had actually been put in place. However since the area was now sealed off due to the coal subsequently igniting, there was no evidence one way or another. Was this negligence or not?

Loss adjusting work is interesting using both technical skills and requiring experience to know what questions to ask, often to determine what is not being divulged. That said, the Polish mining industry is experienced in effective monitoring of all their risk factors. As well as the conventional gas and spontaneous combustion monitoring, seismic monitoring is undertaken to identify stress build ups which could lead to subsequent rock bumps. The industry is also generally good at recording the preventative actions that have been undertaken and the level of such details can make investigation easier.

However over the last five years, although prevention techniques such as the use of Nitrogen, or CO2 or pumping the waste with a mix of flyash, water and CO2 has been well used, the incidence of spontaneous combustion claims is continuing and the similarity between the causation of such incidences should perhaps give more cause for thought.

Robin Dean
MTD Board Member
Ecton Mine

Copper mining started at Ecton as surface scrapes during the early Bronze Age and was almost continuous through to 1850. For much of this time it was at the forefront of technology. Since ceasing production until relatively recently it had a flat spot in technology advancement but the mine is once more pushing the boundaries of engineering.

The copper deposit is unusual for the UK as it was a broadly vertical, broadly cylindrical pipe deposit of malachite, azurite and chalcopyrite situated in the Manifold Valley on the North Staffordshire - Derbyshire border. Its diameter varied between as little as 2m up to 125m and occasionally branched and reunited. The deposit was so rich it was mined using visual means to identify the ore. The mining was so thorough that few visual clues of the mineral deposit now remain to identify its past.

In its day it held the records for being the richest, deepest and most productive copper mine in the world and to break these records it needed up to the minute technology. For much of the time it led the way.

After closure in the mid-1850s the mine flooded to river level and was abandoned until it was bought by Geoff Cox, a member of the Institute, who started to explore the mine and to use it for educational purposes. He also ran a funding body for undergraduates studying mining and used the mine to entice the interests of young people.

When Geoff became ill just after 2000 he started to seek a group to take over the educational aspects of the mine. Eventually a small group of Institute members decided to take it on and formed EMET and registered it as a charity to pick up where Geoff left off.

EMET owns the mine and looks after its structure, health and safety and the field study centre. Educational organisations are trained in mine safety for taking visits into the upper level of the mine to visit the shaft and pipe workings. These organisations are then allowed to use the centre and the mine for educational activity. The Institute’s Schools Affiliate Scheme is one of these, as is the National Trust but the largest user by far is the Ecton Hill Field Studies Association (EHFSA) www.ectonhillfsa.org.uk which attracts about a thousand young people a year on primarily A-level chemistry and geology courses. The Engine House is now in the possession of the National Trust. It is the oldest remaining steam winding engine house in the world, has recently been restored and will feature in a future series of ‘Secrets of the National Trust’ along with an underground visit to the mine to be broadcast on Channel 5 in early 2018.

Over the last couple of years the mine has found itself at the forefront of technology again as a test site for new types of LiDAR surveying equipment and now as a participant in an EU Horizon 2020 Research and Innovation project, the UNEXMIN project, to design, build and test an autonomous submersible to explore for exploitable mineral deposits in abandoned flooded mines. The submersible, known as UX-1, will be capable of diving to over 300m whilst surveying its surroundings and analysing the rock in situ then returning to the surface to communicate its results.

In order to explore confined spaces the robot is limited in size to a sphere of 0.6m diameter where the lack of an umbilical is important as there is nothing to become entangled in old structures.

The Trust is always on the lookout for keen individuals who have experience of underground mines, and their inherent hazards, to work with us as volunteer guides for parties of visitors. It is also always keen to find additional sponsorship to take forward its programme of demonstrating the exciting potential of a career in the extractive industries. Anyone interested in assisting or who can provide information leading to potential sponsors can contact EMET through Anita Horton at anita.horton@iom3.org.

A complete version of this paper can be found on the MTD website.

Graham Woodrow
Trustee and Ecton Mine Manager
Llechwedd Slate Caverns, Blaenau Ffestiniog, Gwynedd, LL41 3NB

A visit to the slate caverns has always been one of the “musts” of a visit to North Wales, but now there is an ever greater attraction - a spectacular Deep Mine Tour. You can travel deep underground and also back into the past on this unique experience; nothing quite like it anywhere else in the world.

The friendly, expert local guides (many of them with family links to the slate industry going back generation after generation at Llechwedd) have their own incredible stories and will accompany you on a journey back through time to the mid-nineteenth century. As you venture into Llechwedd’s mountain – on the steepest cable railway in Britain – you’ll experience some of the iconic sounds which have defined the last 160 years; the clock seems to turn back while you travel 500 feet underground. Once you arrive in the tunnels of the old mine, a combination of leading-edge technology and traditional storytelling is used to bring the miners’ stories to life. Extraordinary light projection, enhanced reality technology and explosive special effects will transport you to another time and place.

After the thrill of the underground, you can visit the slate workshop, based in an original quarry building, dating back to 1852, where you can see traditional slate splitting and maybe even try it yourself. You can see craftsmen making items from slate and then choose your memento of the visit from the tempting range on display in the shop.

Watch the team make quality products behind the scenes including painted coasters, personalised slate signs, numbers and gifts for weddings, birthdays and anniversaries.

When you feel peckish, the Emporium is a coffee shop made converted from two Victorian Miners’ Cottages – you can have a great cappuccino, tea, cakes or a toasted sandwich to keep you going on a day of adventures. The Caverns Cafe has more options including soup and traditional Lobscows – a Welsh stew the miners would have eaten underground as well as freshly made sandwiches, Oink Oink sausage rolls and excellent pies!

This is definitely a visit worthy of a high place on your ‘To Do List’ when you stay in North Wales.

Wyn Griffiths
MTD Board Member

MTD Conference – “Current Developments in the UK Mining Industry”

Elsewhere in this Newsletter, and also on the MTD website, you can find information about the Conference that will be held at Rooms on Regent’s Park, London (note the change of venue from the IOM3 offices, brought about by demand for places) on October 4th and 5th. We have been pleased with the response to this event but there is still time to register and attend. Many people outside of the industry would, if asked, say that there was no longer mining activity in the UK and that it was unlikely that any more would be planned. The purpose of this conference is to show that UK mining is alive and kicking, despite the closure of underground coal mining, and that it is likely to grow further in the future.

We have an array of speakers over the two days of the conference that represent UK mining and who will talk about how their projects are moving forward.

This is an ideal opportunity for those who have an interest in the home mining industry to find out just how much activity is taking place, and, of course, to network with others who have similar interests.

If you haven’t yet signed up but wish to attend, we urge you to do so.

More information at can be found at www.iom3.org/mtd2017

MTD editorial team is headed by Christine Blackmore and Rod Stace.
If you have any comment on the newsletter, would like to know more about us or would like to contribute, please contact us via IOM3, we shall be happy to help you.