RML Newsletter round-up

JUNE 2015

LEAD MINES – WE MADE A DIFFEERENCE

In the mid-1970s I started trials at Fan and Minera lead mines with Professor Tony Bradshaw and his Environmental Advisory Unit at Liverpool University. We were looking at what kind of performance we could get from different seed mixtures in different soils on metalliferous mine sites. Numerous metalliferous sites had already been identified as gross polluters and that the wastes were toxic to vegetation on account of the heavy metal residues that existed in the mine wastes. On account of the pollution that they were creating these sites demanded treatment.

We demonstrated in the trials that newly available metal tolerant grasses did well on bare mining wastes and that this pointed the way towards reclaiming metal contaminated mine sites. Our report to the Welsh Development Agency in 1975 included an appendix in which a 'Survey of natural vegetation' was included and was introduced by Gordon Bottomley's line in his poem 'An ode to ironfounders and others' that 'Grass the forerunner of life has fled'. I have referred to this poem on a great many occasions, it summed up so beautifully the situations that we find on derelict sites.

On these metalliferous sites the grass had fled. The toxicity caused by heavy metals left in the wastes killed-off most plants. This lack of a vegetative cover meant that the wastes were prone to erosion by wind and water and this led to serious contamination in watercourses and areas downwind.

With the availability of metal-tolerant grasses we saw the opportunity to develop a cover of vegetation which would be permanent and remove the risk of erosion.

The first use of the lead tolerant grasses was at Parc lead mine near Llanrwst. A thunderstorm had washed several thousands of tonnes of tailings down onto the flood plain of the river Conwy and this had created an emergency and a very unsatisfactory situation. Among many elements of value in the vale were important cockle beds at the mouth of the Conwy. Parc was a relatively modern mine that had produced a large unstable waste heap of lead tailings. The heap had been formed using a method of hydraulic filling; its existence defied all the laws of physics that we were familiar with. The core of the tip was composed of saturated slime which called for careful handling.

During the works the lead waste was graded to stable slopes and dressed with just 150mm of clean country rock of low fertility and low cost from an adjacent, abandoned quarry. I have mentioned the reliance on low fertility materials before in 'Seeing, understanding and reacting'.

The surface was then sown with lead tolerant grasses which bound the surface layer with the toxic waste below. There has been no further loss of material from the site.

The second metal mine to receive this treatment was Cwmsymlog, a small mine situated to the east of Aberystwyth. The contamination was severe here too, dust in the kitchen of the adjacent farmhouse contained several %ages of lead waste. The same technique as used at Parc was involved with great success.

Several years passed before much larger mines were available for treatment, Minera and Fan for example. Fan lead mine is a particular example of where landscape design was an important element of the project. At Parc and Cwmsymlog landscape considerations were not considered to be important when compared with the emergency contamination issues that had to be resolved. At Minera near Wrexham industrial archaeology was important too and we employed a resident archaeologist on the project.

Fan mine lay in an agricultural area close to Llanidloes and as well as being a serious source of pollution at the headwaters of the river Severn it was a hideous landscape scar. Metal content in the wastes ranged between 5% and 15%. At Fan we were able to 'borrow' subsoil from adjacent fields to provide a growing medium for some of the areas that were planted up as woodlands, the stream was diverted and toxic slimes were protected by being encapsulated with a membrane and a surface covering of sub soil. Parts of the site were scraped clean of metalliferous waste which was placed in the encapsulated area. Toxic flows from the mine site were eliminated.

In every case the elimination of the heavy metals downstream led to significant improvements in the benthic populations and aquatic flora in the water courses.

Parc and Fan have been the subject of many visits by international experts and much studied by students.

The landscaping was so successful and appropriate at Fan that a commercial photographer searching for the site from an aeroplane failed to find it; just one of our claims to fame.

PROGRESS AND THE DEATH OF FREE-THINKING

'On discovering Regulation, regulation, regulation -*In managing our environments more regulation enfeebles the science and common sense that we take great pains to impart in people who then become entirely reliant on regulation and what amounts to state control of free-thinking, observation and reporting.' Ivor Richards.*

Oh yes, indeed, when free-flowing guidance in the hands of regulators congeals into turgid regulation our advanced civilisation will flounder. A message in a cleft-stick arrives by runner:

> *'Discovered source of bluestone megaliths - STOP – Pls consult authorities - STOP - Logistics plan Carn Menyn Preseli to Amesbury Wilts - STOP - Urgent obtain permits – STOP'*

Next day, there I am at the DCCPFO office soon after sunrise to meet the Chief Refusals Officer in the Refusals Team of the Permits and Licences Section, Department of Community, Complex Procedures, Forms and Obfuscation (DCCPFO).

I sit down on a convenient boulder and wait my turn.

"Mr Idris?" Calls out a female flunky in leopard skin, "The Great Man will see you now."

I follow the directions and arrive under a large oak tree. Behind a smart desk is a spotty, gormless youth with a brand new degree certificate in a frame on the desk beside him.

I smile, "I have an appointment to see the Chief."

"He's consulting on how to refuse an application." He replies. The young man shuffles some papers and puffs out his chest. "I am Deputy Chief Assistant to the Assistant Chief Refusals Officer and I will be dealing with your application."

I set out the plan. Nothing unusual, I tell him, just the extraction of 165 huge megaliths from the western edge of the world and transportation to the world's navel[1].

"We will reject the application," States Spotty Youth.

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[1] N.B. Scientists working during the dying decades of the Ice Age discovered that the world's navel was on Salisbury Plain in Wiltshire.

I am aghast. "Why?"

"It's our job to apply the regulations. It is your job to satisfy our every whim and then bear the costs of refusal without question. But, as you ask, I can advise you that the 'Movement of Stones Regulations' state quite categorically that no stones shall be taken from the western edge of the world to its navel."

I take a deep breath and count ten mammoths. "There are no regulations! I am aware of the DCCPFO's Movement of Stones **GUIDELINES**. They advise against unnecessary movements of megaliths from the western edge of the world and give an example of good practice where such megaliths are to be placed on end in a big circle for religious and community purposes. There is a stated aim in these Guidelines to encourage innovation!" I press home my point, "Our henge project is highly innovative, addresses an identified need and will bring economic development to two deprived regions, not to mention jobs in extraction, transportation, construction and operation!"

I can see that proving him wrong has made my job harder. Spotty Youth may not appreciate the difference between Guidelines and Regulations, but of course he can't be seen to be wrong!

He gives me a sly look, "But not if you exceed 164 megaliths! And," he continues, "Some of them are to be placed as beams across the tops of adjacent vertical stones! That is not covered in the **REGULATIONS**!"

"But there is nothing in the **GUIDELINES** to say it can't be done." I explain.

Spotty Young puffs up his chest. "I have a degree in science which says I am clever. "I'm not paid to spend my valuable time thinking about how to apply guidelines and making professional judgements!" He is indignant. "If you want to build a henge out of stone then you must prove your scheme does not exceed what you choose to call 'Guidelines'!"

While I am on the back foot he continues, "We will 'screen' your proposals to see if they exceed certain criteria. If they do you must prepare various impact statements, assess the impact on heritage (after all, moving all those big stones around might cause some head-scratching in several thousand years' time), and," He pauses for breath, "And there will be all those other statements to ensure fairness to all those people in the Department who would probably feel left out and disregarded if you don't prepare one to address their personal interest.

On my return to the office I send a quick message by cleft stick and runner to my client.

> *'Authorities consulted - STOP – Prove unable to reason - STOP – Megalith extraction to stop - STOP – long delays likely– STOP'*

'*Where clever fools are comforted by regulation, wise men apply guidelines with wit and reason*.' Merllyn y Dewin AD 510

ACCEPTANCE OF NEW IDEAS TAKES TIME

Current intelligence received at RML tells me that ideas which I consider only to be of historic interest now are still worth further discussion.

In the 1980s the British public became increasingly worried about their quality of life and damage to the environment; that worry is even more entrenched in 2015.

Throughout the 1980s I saw and wrote that planners and architects were considered to be, and were found guilty of, destroying the quality of our towns and cities. I wondered if the juries had been rigged.

At that time I was afraid that engineers would be heavily criticised for our apparent indifference to the environment in which we worked as well as our complete distrust of professionals in other disciplines. It was clear to me that engineers needed to acknowledge that environmental issues would soon test their understanding of the natural world and their ability to survive in a new professional climate.

I argued that when specialist knowledge was applied early enough, beneficial environmental features could be integrated into conventional engineering approaches without anyone suffering excessive additional costs. To achieve this new thinking, new techniques and new approaches would be required.

This new thinking has been around now for more than 30 years but it seems that a few mantra that are well ingrained at RML are still worth discussing with a wider audience.

30 years ago few engineers appreciated that a freshly re-graded highway slope dressed with top-soil could be inhospitable to many plants, especially those not naturally found in that part of the country. In 1985 I was asked quite specifically by a landscape specialist in a government department to find out 'What is going wrong when vegetation on highway slopes fails to develop'. RML studied the issues involved and conducted trials to discover which techniques and species were most successful.

There was much that was going wrong: soil quality was poor, especially when soil had been stored for some time, soil type and profiles, slope steepness and aspect were all ignored. Local vegetation that was surviving quite happily was overlooked and seasonal timing was not considered. The concept of applying an appropriate management regime over several years was almost laughed at. "You mean you want us to spend money AFTER the job is complete?" was a common and hostile reaction.

Assessing the problem of what was going wrong when, for example, vegetation on new highway slopes simply failed to grow, led to a general review of how the establishment of vegetation could be better understood by engineers. At the time engineers knew very little about soil and even less about

vegetation. I pointed out that site, soil and vegetation were intrinsically linked and designers needed to respect this link from the outset. I stressed the importance of managing a raw and young cover of vegetation with care and understanding. Importance was placed on including a secure budget for management using appropriate equipment and materials; all of which would lead to a long-term improvement in performance.

A change of thinking and practice was required; a change which had to be appropriate in a civil engineering world. In 'Seeing, understanding and reacting' in May, I discussed vegetation establishment on earthworks and commented that the changes are not yet 100% accepted. The bottom photo shows the effect of detailed consideration of slope, aspect, soil profile and species selection in the recent treatment of steep slopes along the M4 near Cardiff.

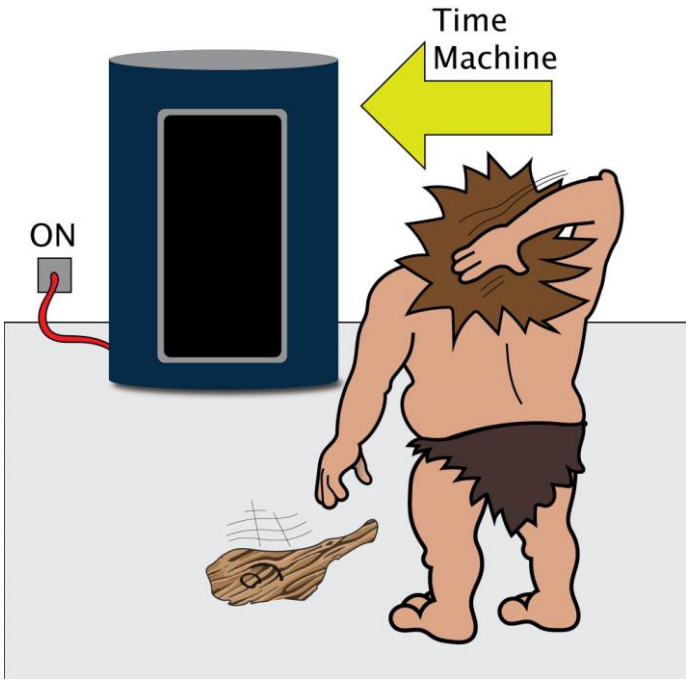
IMAGES (FROM TOP): PRE 1980S HIGHWAY VERGE, 1985 TRIALS, STEEP SLOPE IN 2013

A HEAD FOR FIGURES

I've just seen the following in a marketing email from a software company:

*"In client news **********, a major international consultant, has cut defect resolution time by more than 100% using our mobile inspections and defects management solution."*

Now if it used to take 3 days to resolve a defect, and you cut that time by 33% then you achieve resolution in 2 days. Cut it by 66% and defects are resolved in 1 day. A cut of 100% takes away all of the time previously taken to resolve the defect. So here's the clever bit – this company has adopted a 'management solution' that must resolve defects BEFORE THEY ACTUALLY OCCUR! I know that our MD goes on about leading from the future but this claim 'takes the biscuit'.



Other adverts claim '3x more output' when they mean 3 times as much (e.g. 9 instead of 3 units), or 'two times bigger' when they mean twice the size. You wouldn't say your product was 'one times bigger' if it was the same size as before, would you?

I may sound like a pedantic old f@rt who cannot adapt to change, but this random use of mathematical-sounding terms, designed to impress and sell product, simply muddles the language and makes it harder for us to make ourselves properly understood when we need to be. It must stop!!

I have talked before about sloppy thinking and sloppy writing in January and on several other occasions, it does us all no favours.

ESTONIAN OIL SHALE – PART 1

I made my first visit to Estonia in late 1990 as part of a Know How Fund programme which was operated by the UK Government. I was invited by the Virumaa Foundation, a very early NGO and think tank focused on developing sustainable practices and assessing the environmental issues faced by the Oil Shale industry. Virumaa is the name of the administrative district that covered the oil shale area. Estonia was facing unprecedented problems since until only recently ALL decisions about almost everything that took place in Estonia had been made in Moscow. In addition to forming a new administrative system the question of land ownership presented formidable problems for individuals and the oil shale industry in particular.

I arrived in Tallinn via Helsinki on a Monday afternoon. Checking of visas and passports took 1.5 hours, being British I had waited my turn quietly and was last out through the arrivals door. The details of each person entering the country was laboriously written out in a ledger. Some things would change very quickly.

I was met by two young men, Antti Roose and Mart Maidla. Antti was to become a close friend and colleague. Antti was a university graduate in geography from Tartu. Mart was a chairman of the Virumaa Foundation. We had supper in a darkened restaurant in Tallinn and I was then driven to Kohtla-Jarve. Kohtla lies in the centre of the oil shale producing area where I was deposited in a kind of guest house. In the morning I was met by the region's environmental head Mr. Aado Endoja, former mining engineer, and taken to the staff canteen of worker's hostel in Johvi. The canteen was a living hell, I was given some rice pudding, a boiled egg and few pieces of bread by a woman who was clearly drunk and suffering from a blinding headache.

Mr. Endoja and I were met by Antti and I was taken to see the giant oil shale waste heaps of which there were two kinds, black ones which were the semi coke residue of distilling the oil shale and white ones which were composed of the waste from separating the oil shale from the natural country rock which was an Ordovician limestone. I had never seen their like before they dominated the landscape. The oil was used to power electricity generating stations; most of the power went to Russia.

On the way back into Kohtla with 3 of us in Mr. Endoja's Moskvitz we had to negotiate a sort of railway crossing and the car lost its exhaust. The journey into town with the Environmental Health Officer was accompanied by the most horrendous noise of the Moskvitsh minus its exhaust. The car was fixed over lunch.

On the Wednesday I met Mr. Paalme, the Chief of Mineral Resources of the Ministry of Environment. We met at rural junction on the road from Tallinn to Tartu; he came out by bus from Tallinn. I spent the next 2 days with Mr. Paalme, both of us stuck in the back of the Moskvitsh, the working language was German, and we were soon on first name terms. I provided Guido with an outline of how the mining industry was managed in the UK. I had taken a small folio with me of reclamation and rehabilitation projects and guidelines of good practice for which RML had gained some reputation. I appeared on prime time news Estonian television interviewed on the Kivioli semi coke heap by Ago Gaskov. On Thursday I spent the night in the Olympic Hotel in Tallinn. Tallinn had hosted the sailing events for the Moscow Olympics so the hotel was highly modern and comfortable by Russian standards. Andres Tarand, then MP of Soviet Estonia and the head of parliamentary environmental committee, later the Prime Minister and recent MEP, came to meet me and we spent quite some time discussing the contents on my folio and the kind of assistance that the oil shale industry needed. Guido and Antti joined us and we agreed that the oil shale industry needed the kind of advice which I could provide.

I was put on the plane home clutching a sticky dark brown loaf of Estonian rye bread. In the car on the way to the airport I mentioned that I had enjoyed the bread, the car was stopped and I can still see Guido running up the steps to a bakery and coming out with the beautiful loaf of bread as my present.

I had been to a different world and the opportunity presented itself for me to change it.

Antii sent me an email the other day and said “What is remarkable and highly important, we had met several Nordic people here by 1990, you were a very first ‘live’ professional coming from real West. And just a few weeks ago March 11 I gave a speech in front of local businessman in the oil shale region, recalling proudly RML mission and its pioneering role in environmental engineering and know how transfer - how all this new era started.”

LIKE AN ICEBERG, 90% OF A CONSTRUCTION PROJECT GOES UNSEEN

It's been a busy few weeks on site for our contracting arm, RML Bioengineering, having completed a tricky little project last week alongside a house called Swn yr Afon (Sound of the river). Amazingly 13 days of site work followed 9 months of activity to gain permission and permits for the works.

We had been asked last July to look at a collapsing retaining wall at the rear of a property near Caernarfon by a long standing client of ours, Cunningham Lindsey, a loss adjuster. The project was made more difficult than normal by the close proximity of the house, which was considered to be under threat, and the stream running along the length of the base of the wall. We are normally called in when a softer or hybrid solution is considered, but in this case the tricky access and the sensitive local environment suited our capabilities. We were pleased to respond.

We understood that there was some urgency to carry out the works, ideally before the winter and high water levels in the stream which would potentially further undermined the wall. We quickly drafted an outline design, with the aim of being in the stream bed for as little time as possible. To accomplish this and still build a sufficiently robust wall we turned to Ruthin Precast Ltd. and their RockWall units.

The client and homeowner were happy with our proposed design and we were commissioned to set about gaining planning permission for the works (all engineering projects require planning permission). A planning application was submitted in early September and granted on 24th October, 2014 after additional work had been carried out and more detail provided on our tree protection measures in our method statement. One condition was applied however, denying access to the stream bed between 17th October 2014 and 17th April 2015, the fish spawning season. The wall was left for another winter.

Works were eventually set to start in June 2015, to take advantage of the long days and lower expected rainfall. Before we could begin we had to consult with Gwynedd regarding Land Drainage Consent (LDC), no longer part of the NRW's remit for minor rivers, and therefore not part of the process for consulting on the planning application.

The Flood Risk Engineer I met on site was most helpful and advised that we only need seek consent for the temporary works. An interesting note was that if our temporary works had been removed from the channel each night, we would not have needed LDC at all.

As part of the application for LDC and at further expense to the client an ecology survey was undertaken to the exact requirements of the Gwynedd Biodiversity Officer (whose predecessor had been consulted as part of the planning application, and been happy to proceed in the absence of a survey).

The survey was carried out, covering 100m up and downstream of the site, and nothing of note was found. After around six weeks of preparing method statements, ecology reports and drawings of the temporary works the application was submitted and Consent was granted in a matter of days.

Works commenced on 8th June 2015. The river was piped and dammed, and a working platform constructed from clean 40mm granite. Water quality was tested up and down stream of the works using a turbidity meter, and once our platform had been established there was no measurable impact on the water quality for the duration of the works, just as we had expected.

Works continued at a pace, while the weather was favourable. The foundation slab was poured, and the precast wall units installed and fixed by day 7 of the works.

The material from the original wall and the excavations for the slab were used as back fill to the new wall, and for building the returns at each end of the precast units. Nothing left site. On day 11 we were replacing the boulders from the river and removing our temporary dam and pipes.

The last two days were spent erecting the permanent fencing, soiling and seeding behind that new wall, and making good the area of our access ramp.

Note shovel for scale!

The client is very happy, as is the homeowner, after having the worry over the safety of the collapsing wall. Moss and ivy will soon help to blend the new fresh walls with the old, and the bramble and nettle return to the opposite bank. By late summer it would be difficult to tell the works had taken place. The house has been in the family for two generations, and at the request of the homeowner we have prepared a slide show of the works photographs on DVD so that her mother can see them from her nursing home.

INTEGRITY IS FUNDAMENTAL IN BUSINESS

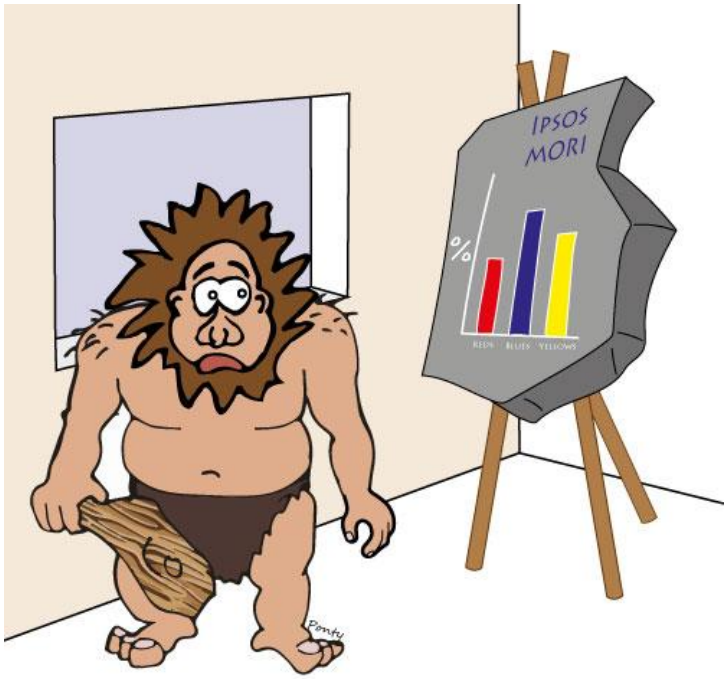
Fact; Integrity in business is a fundamental principle that is valued by both parties to a contract.

An Ipsos MORI Captains of Industry survey reveals that;

'81% of business leaders view honesty and integrity as an extremely important value when judging a company, more important than the quality of management (58%), products or services (50%) and customer service (50%).

Although financial performance is also important, only one in four Captains (26%) consider it to be extremely important. In 2008 during the peak of the recession, this figure stood at 35%.

Acting with honesty and integrity has been the factor of greatest importance when Captains judge a company for the last three years, 75% considering this to be extremely important in 2012, 90% in 2013 and 81% in 2014.'



Only 26% of those surveyed by Ipsos Mori considered financial performance to be extremely important when compared with other factors. What a contrast then with the public sector, about which I have moaned on several occasions, where procurement generally works on the principal that cheapest is not necessarily the best but we'll take it anyway. We all know that this is inherently flawed don't we? Yet people stick with this approach simply because the precautionary principle over-rides all of their thinking and extends to 'who can complain if the cheapest bid is accepted'. Well I do and so does my MD who commented in January on the importance of quality and John Ruskin's common law of business.

It also seems to be perverse that in the public sector past performance is no longer a criterion that can be taken into consideration, good performances or poor ones in the past can have no bearing today. How often is one drawn into thinking along the lines, how on earth did they get the job after their last shambles? I see it happening all of the time BUT don't hold your breath, things might change.

A recent EU directive about tendering indicates that past performance can be taken into consideration when bids are being assessed. It will be interesting to see which public body first takes up this opportunity.

For the moment those thinking that integrity and quality of service and past record will see them through to creating a successful business face a difficult time; for the moment it seems best to seek out clients amongst the 81% that Ipsos MORI identified, they seem to be worth doing business with.

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