

March 2019

CAUSES FOR CHANGE

Two causes - worth thinking about

Engineers can create opportunities to make the world a better place but some things in civil engineering seem not to change at all and where change is happening I fear that things only move at a glacially slow pace. No wonder I hear people saying that in many respects we have moved little since the Egyptians were building the pyramids. Disposal of human waste is a case in point and Bill Gates has some interesting ideas of how to move this issue forward. His ideas of introducing the latest technologies to tackle this problem made the world press recently. For sure far too many people around the world are dying because of the lack of sanitation. In my livery company, the [Worshipful Company of Water Conservators](#), our motto is that without water there is no life, but the engineers in the company add a postscript that without sanitation life is short. . The livery company has supported a group that installs latrines in Africa



Good practice on an RML pipeline project - thin mountain soil stripped in 2 layers and separated from the undisturbed ground by a membrane to simplify restoration work along the 'right of way'

Simple latrines can be sponsored for a modest sum of money; they save lives and improve the quality of life in rural areas. Control and prevention of disease must be an overriding priority for all of us and improving sanitation is a cause that needs to be supported.

Since you started to read this it is very likely that 2 children have died from diphtheria in Africa.

One of the people proposed to go on the new £50 note is [John Snow](#), the father of epidemiology who famously shut the water pump in Broad Street in Soho to demonstrate that cholera was waterborne. Since then epidemiology has developed as a respected science and countless millions of people have avoided the killer disease because they have had access to clean water. John Snow is one of my heroes because he led from the front. John identified a problem, was emotionally involved and took precipitate action. Look him up, his story makes interesting reading. More on leading from the front on another day.

Dr. Rosalind Stanwell-Smith, the Secretary of the [John Snow Society](#) was my guest of honour at the Michaelmas lunch of the Worshipful Company of Water Conservators in 2013 when she delivered a fascinating review of John's work.

It's a time for change for today's engineers much closer to home too because I find that engineering specifications for earthworks still label cultivated soil as 'unsuitable'. I wrote to you some 3 years ago about this and it still troubles me.

Pedagogic soil, 'top soil', dubbed 'unsuitable' by engineers is a living material that takes millennia to develop. In our environmentally aware profession engineers need to re-think their attitude to the labelling and use of soil. What engineers have done is stolen the word 'soil' to describe a geological formation that does sometimes look like soil but has recognizable engineering properties that can be exploited.

In my early years in civil engineering in the 1960s my view was that top soil was maligned by engineers who labelled it as 'unsuitable'. This attitude of mine arose because I well-remembered that we had had farmers and keen gardeners in the family. I had grown up with a sense of respect for soil.

In stripping a site to expose material suited to their purpose engineers ignore the fact that 'top soil' could be made up of several distinct layers which held a strong relationship one with the other and that the sequence of layers was vitally important in determining how the soil performed. Having ignored or even been unaware of the distinct horizons in the undisturbed soil, engineers then tended to store the stripped soil in a randomly mixed single stockpile and eventually use their 'top soil' as one layer placed on an engineered surface. To the surprise of many engineers this single layer was quite unable to support vegetation successfully and on many occasions indeed added insult to injury by simply slipping off the surface of the engineered earthworks - not much of a shop window for engineering or engineers there.

A changing attitude was triggered by the publication of the CIRIA report on 'Use of Vegetation in Civil Engineering' which was published by Butterworths in 1990. The report was re-issued by CIRIA in 2007. It would be nice to think that things have changed but 'unsuitable' is still a word that is bandied about. 'Unsuitable' is a sad word to apply to a material that is a living thing for which we should not find a 'mean' purpose but preferably one that enhances our work. John Locke reminded us that 'Nature never makes excellent things for mean or no usage' and we would do well to keep this in mind.

Kind regards

Ivor

Managing Director

Richards, Moorehead & Laing Ltd

COMPETITIVE FEES

'Fee competition remains a problem and all too frequently fees are simply not adequate to undertake services properly'.
Griffiths and Armour – 2019.

Oh I do so agree. I have always thought that engineers are the world's worst business men. I put this down to the fact that in an engineer's world technical issues pose exciting challenges and are considered to be much more pressing than commercial ones such as 'putting bread on the table'. Being an engineer and having worked alongside many engineers I can understand their approach. 'Doing sums', producing drawings and actually constructing things is exciting. But being a professional means that you have to be aware that at some stage you need to be recompensed for your efforts and that money is important. I learned at an early age that having only a small regard for the value of one's own work is a serious failing.

Competition involving winning design work on price has been disastrous for a good many individual engineers and for the profession in general.

Fee competition became the vogue in 1984 when the prime minister, Margaret Thatcher, decided that professionals had had things too easy when their earnings were based on scale fees that depended on the cost of the work being designed. From then on commissions for work in the public sector had to be based on the lowest price. Engineers were the first to fall for this edict. As I have said, engineers aren't business people. I guess that not many of you will remember the days when engineers were commissioned under 'Model form A' a document that was produced by the Institution of Civil Engineers. So far as I can remember the Institution made no meaningful comments at the time when scale fees were abandoned since they were not at all interested in the commercial aspects of being a professional engineer. I think that it fair to say that other professional bodies such as accountants have obviously had a different view of how things work in the real world.

I must avoid being too negative. I do believe that reputation for the quality of past work is now figuring more importantly than price in some people's consideration of an engineer's suitability for work that they want to commission. It has taken a long time for this change to come about and the change is not yet happening everywhere. Many people at the highest levels in government still equate lowest price with best value. I am all for commissions being won in competition, architects have lived with competitions in respect of prestigious projects for years, but not on price.

In school we were told that 'putting the goods in the window' must be a prime driving force in completing our examination papers. "How else would one assess the value of what you are putting down on paper" we were asked. The same does apply in business, content has to be matched by style and quality.

So it is incumbent on us to present our knowledge and experience to potential clients in a truthful, accurate and meaningful way. This is not as easy as it sounds.

Kind regards

Ivor

Managing Director

Richards, Moorehead & Laing Ltd

NEVER, NEVER SAY NO

In business you can set yourself up to be a specialist in something but this does not stop people asking you to solve their own particular problems. People can and do ask one to get involved in the strangest things. Because one of my colleagues had been responsible for a curved concrete sea wall we were asked to design a reinforced concrete skate park. We subsequently designed and built more than 30 skate parks. This is only to be expected when you put yourself up inadvertently as a problem solver.



I had never seen myself in that role but I was told many years ago by a senior Welsh Office person that he had always viewed me as a problem solver. He called me down to Cardiff for a meeting, he had a problem because there was no proper method of managing landscape maintenance on trunk roads in Wales. In 2 years we produced for him a map-based and spread sheet programme of site related seasonal activities and costings. We called the programme 'Trunks'.

What one must do is not over reach in terms of experience and capacity. What we were able to apply in respect of landscape management for the Welsh Office was an understanding of how important vegetation management was and we also knew how to develop spread sheets and data bases.

I must admit that I have always liked trying to make difficult things easier. For example, I introduced improvements in working practices in main-laying work in the waterworks department in the City of Cardiff. Fire hydrants and valve chambers were always getting 'lost' when re-surfacing of roads and footpaths took place. I introduced simple chain-surveying methods of new water mains to record the positions of fittings in relation to fixed features such as kerbs. My 'chain books' were kept for years as a valuable record of what I had been responsible for.

In terms of land reclamation the idea that engineers should collaborate with other professions was seen by some of my colleagues as mindlessly inappropriate, "What can we learn from them?" I was asked. "Oh dear, oh dear" I thought as I considered what we engineers were getting into. We had volunteered to provide engineering solutions to problems that were manifest in degraded and disadvantaged landscapes and communities. These problems involved social and environmental issues as well as the need for new roads and sewers. I felt that engineers should recognise and react to these new demands. I also admired [Nan Fairbrother](#)'s words and ideas about new landscapes leading to new lives.

The multidisciplinary approach was my 1970s answer to problems that other people had not started to think about. In January and February 2016 whilst discussing 'Diffusion of knowledge' between communities and between disciplines I said that back then in the 70s I was attempting to trigger a greater impact on the quality of life in communities that had been raped by unthinking mineral exploitation. I realised that engineers were too blinkered in the view of what was important in a world that was beginning to think about 'the environment'. These topics are even more significant today when we are obliged to consider the wellbeing of future generations. Engineers did not enjoy overwhelming support from the man in the street because of the messes that were frequently created as 'par for the course' on many construction projects. In 1994 [Edmund Hambley](#) warned engineers that they needed to change their careless attitudes about the environment.

As a technical response I developed my team of specialists to address the environmental topics that I thought were related to our work. I have mentioned before how, in 1984, I was instructed to "Sack all those environmentalists". I did not say "No" I moved on and have been complimented on the results we have achieved and the services given to civil engineering.

Kind regards

Ivor

Managing Director

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YET MORE ABOUT CHANGE

I am firmly convinced that people who promote change are those who lead and learn from an emerging future. This idea is the prime focus of the thinking of [Otto Scharmer](#) who said that the approach was dependent on people seeing an opportunity for change because something was going wrong, were emotionally involved in this situation and took precipitate action to deal with it. Leading from the front is a much more effective place to be, better than leading from the back, even though when being out in front one is subject to obfuscation in all its forms.



This effort to create change is driven because one is propelled by emotion.

Think about [John Snow](#) when he was firmly convinced and quite rightly so as it turned out, that cholera was a waterborne disease but this was disputed by the water companies in London who were supplying the polluted water. They said that cholera was air borne. John was a medical man whose neighbours were dropping like flies on account of cholera. Emotion overcame any doubts and he took precipitate action by shutting off the pump in Soho from which the people were drawing their water – problem solved. John is regarded as the father of epidemiology, a science that has saved countless numbers of lives since then.

Reflect too on the action of [Hugh Myddelton](#), the MP for Ruthin. Hugh was a member of the Goldsmiths Company in the City of London and built the New River which brought fresh water into London from Hertfordshire. The condition of the water and its supply to the city in the 17th century was desperate. The [New River](#) was one of the greatest engineering works of its time and was strongly condemned by landowners who claimed that it would cause their land to flood and anyway thought that the idea was impractical. Construction took 4 years. The canal was completed on 29th September 1613. The whole venture turned out to be an example of good engineering practice and was an extremely profitable one. The gradient of the 'river' was 5 inches per mile. The history of the project makes interesting reading and describes how one man overcame severe financial and physical challenges to deliver his idea. The New River played a fundamental part in the growth of London into a leading city in the world and still contributes to the water supply of London today. In September 2013 as Master of the [Worshipful Company of Water Conservators](#) I arranged a celebration of Hugh's achievements 400 years earlier with a special event here in Ruthin.

As a side swipe at those who do not recognise and embrace change I must mention the comment by the chief scientific officer to Winston Churchill who said that rockets would never work in any military sense and was proved to be so wrong by the German rocket designer Wernher von Braun. Much more recently another man at No. 10 Downing Street thought that emails would not catch on. Where would we be today without the degree of communication that emails provide? Well.....

I worked with a manager in the 1970s and 80s who said that he knew all about computers and they were more trouble than they were worth. I also had colleagues who thought that engineers had

nothing to learn about soil and vegetation and a chairman who thought that environmental specialists were a waste of time, but change was in the wind. Away from head office I introduced electric typewriters with a memory and then some very primitive word processing on a BBC computer. Don't laugh, these were big steps at that time.

In 1984 RML's first Wang word processor cost us £7000 with a tiny memory. Their computers were special but Wang lost their way and failed to deal with the advent of Microsoft. In our world business is still changing fast and to cope David regularly strengthens our IT system by making it more robust, physically smaller and yet faster. My IT specialist friend tells me that thanks to David RML has as good an IT system as one would find in any business. All of our accounting systems which we wrote about 25 years ago are redundant because of HMRC requirements which are aimed to reduce the chance of fraud in small firms, their words not mine.

Typically, Idris wondered out loud what HMRC were doing about fraud in big firms.

Kind regards

Ivor

Managing Director

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ACCEPTING THE ROUGH WITH THE SMOOTH

We never question that the surface of the earth is generally smooth. I don't mean the big stuff like mountains, rift valleys, glaciated valleys or drumlins; I am referring to the surface of the ground that affects us as we walk around. Our perception is based upon our everyday experience of walking across a lawn or street or looking out of a car window to see verges, fields and paved areas. Whilst it is only in the last 60 to 100 years that mechanisation has wrought large scale smoothing of irregularities, the surfaces we experience have been shaped by millennia of cultivation and earthmoving. Without all of that we would be living in a world where the only straight line was line of sight and the only smooth surface was standing water.

In accordance with the usual history of our modern landscape it all begins with the Ice Age. The retreating ice sheets, working like giant bulldozers, draglines and demolition balls, left us with a broken boulder-strewn, cliff-filled land of polished and fractured rock, smoothed landforms of clays, sands and gravels heaped-up,



smashed, scraped out, rounded off and then thrown around. That topography decided where rivers should run, lakes stand, marshes form, and the most and least productive soils lie.

It was the huge and thundering rivers of melt water that next took up the cudgel. The power of water formed, lifted and mixed the materials, carved river valleys, threw out outwash plains and filled in the bottoms of some glacial valleys. Finally, it was the spread of vegetation that took up the slack and commenced a determined, patient but slow task of sculpting the land surface

If you walk into a truly [ancient woodland](#), and these are very rare in the UK now, you will find a ground surface that is pitted and raised as if some buffoon with time to waste had set about the soil with a giant shovel. One of the strange features of these deep woods are pits filled with dark forbidding water, ridges and sudden drops into stony hollows. There are woodlands of this kind that are filled with huge old trees that date back hundred of years. In times past these unexplainable earthworks were ascribed to the devil. Modern research into the records and archaeological work on the ground has determined that in some cases these landforms are the remains of medieval quarrying, charcoal burning, glass making, metal working, or even plague villages and lost moated manor houses that predate the existing tree cover. But not all are man-made because the evidence points to some areas that have an unbroken record of woodland cover. What we see in these are the last remnants of the land surface that would have been familiar to the hunter-gatherer of the Mesolithic. What they knew was a surface that had been created by the roots of trees.

Consider a tree that is growing within a woodland that has never know the axe or the adze. The trees fight to gain the ascendancy over those around them, growing taller and taller. Eventually the winner would form the main canopy of branches and begin to spread and increase its girth. There would be nothing to stop that growth until it either died naturally of old age and remained as a standing rotting trunk for a very long time, or it was destabilised and fell amongst its rivals. Trees that died standing would form a low mound of organic matter. Trees that measured their length on the ground would pull up a huge root plate many metres in diameter but not so thick as one might imagine. Tree roots do not go deep into the ground. The root plate would end up standing vertically above a pit where the roots had been. With time the roots rot down and the soil and stones held between them would drop to form a raised lip on one side of the pit. It is interesting that archaeologists have found evidence of human occupation of these tree-formed hollows where a shelter was made by hunter gatherers.

The huge trees of antiquity could have shifted many cubic metres of rock and soil and opened up the underlying ground to weathering and erosion. The pit and lip would change little over the ensuing centuries and each falling trees would add to the chaos creating a pattern so complex that it is impossible to pick out the actions of one falling woodland giant.

In most cases many of the existing trees in an ancient woodland are relative new comers, the history of the site lies in the soil.

Kind regards

Andrew

Principle Landscape Architect

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PLANNING | LANDSCAPE | ENVIRONMENT

Carl Lagerfeld died on 19th February 2019 and he was reported as having said in various interviews;

"We created a product nobody needs, but people want - In business you must have a logo since names are easily forgotten - Fashion is something that reflects our lives and times with the shortest release because, cars, design and architecture take years to realise."

Pearls of wisdom from a designer and business man renowned around the world and worth thinking about.

I agree that the benefits of most building or construction work takes years to be realised. But I have been lucky in that some of the designing I have been engaged on has had a relatively short release period and it did reflect on our times and lives. The changes that reclaiming and rehabilitating derelict land was focussed on were a public need and immediate benefits such as public safety. It was meant to be so even though our designs also involved long term plans for the development of landscapes. These were ideas that developed quickly as a by-product of an emerging future in which engineers began to respect the environment.

So at RML we are a little more fortunate than those working in the world of high fashion and high cost in that people do need what we can provide them with. Sometimes they do not want to hear what we are telling them though in respect of the complexities of life today! Clients think that they are asking for something simple, such as getting planning approval and environmental permits by the end of the month or even the end of next month. It's not that simple.

Again in contrast to high fashion, at one time our claim to fame if we ever had one, was that we were instrumental in formulating a low cost approach to land reclamation so that people could more readily afford what they wanted. This was an early approach to using resources wisely and it worked for us as well as our clients. Whilst the work was done at a 'low cost' this was not cheap work and we were well paid. The work was innovative and reflected well on everyone involved and was effective because it was simple to execute using conventional machines and processes. We just used existing situations, current methods and waste materials differently. But being recognised for what we had developed took years, probably about 20 years and was well copied and used by others. I suppose it was the same only immediately so with fashions. Carl reflected on how in his world what princesses wore one day M&S was selling the next.

Carl is right too when he talks about company names. Richards, Moorhead and Laing Ltd is a bit long and RML is probably more easily remembered. Our first logo in 1984 was changed in 1990. We were

selected to take part in an exhibition of Welsh businesses promoted by the EU (remember them) called the Europarternariat which was held in the grounds of Cardiff Castle. We knew that our logo needed refreshing so the printer volunteered to come up with something and we let him get on with it, We were given simple shapes and squiggles which were intended to suggest mineral waste heaps, buildings and soils. We still use it. Elsevier the international publisher liked it and used it on the cover of the report we produced for the European Commission which Elsevier printed and promoted as part of the team.

I don't think that we got any business out of Europarternariat but it raised our profile enormously and encouraged us to look seriously at Europe as a potential market. This was fun, we got paid for some of it too, and we worked with wonderful people and made lots of good friends along the way. What we talked about and practised was very well received and it did us a lot of good in developing our own confidence in our approach. We sold our principles of low cost reclamation in English in North America as well as in Estonian, French, German, Italian and Spanish around Europe.

I guess that this was when the logo scored well.

Kind regards

Ivor

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