
The Health & Safety Dichotomy

One of the courses I delivered many years ago was entitled the “*Health Safety & Welfare at Work Act*”. The most important lesson to be drawn from the subject related to the role of the Health and Safety Officer. The appointment is more powerful than that of company CEO. It is possible for a Health and Safety Officer to shut down production on the slightest whim. Best of all, the Health and Safety Officer cannot be dismissed for having brought the company to a complete standstill.

One former company director told me that he had been headhunted on more than one occasion because of his aptitude for identifying and neutralising troublemakers within a workforce. His method of troubleshooting employed a two prong attack. The first part of his method was to compare the production levels on different shifts and shuffle the workforce shift rosters until he narrowed the field. His theory was that the troublemakers would take their trouble with them to whichever shift they were on. Then it was a matter of setting some form of trap to catch the person or persons whom he believed to be causing production problems. If the trap was triggered, the dismissal process ensued.

Under normal circumstances, dismissal could be a difficult thing to achieve and prove very expensive for a company. It was at that point the second part of his strategy paid dividends. Part two had been running quietly in parallel with the first part from the outset. He had been familiarising himself with the background of the employees. Since he had access to their salary histories and could “*Social engineer*” information about their family commitments and habits out of workmates, it was easy to spot any staff who appeared to be living beyond their means. Troublemakers usually turned out to be people who were living *well* beyond their means. The threat of an investigation by Inland Revenue would usually result in the employee handing in their notice and leaving without benefits.

The troubleshooter maintained that the problem employees were all “*Commies*”. He was adamant that they were in the pay of the Russians. He may have been right. However, no company is without its competitors, and it is more probable that the troublemakers were in the pay of a rival Western Corporation. In those days, the troublemakers were usually engaged in sabotaging machines or damaging goods. With the advent of the Health and Safety Officer, life has become much simpler for anyone on the take. Even if a company has clear evidence that the Health and Safety Officer is routinely obstructing production, there is little that can be done about it.

For those of us who have lived a charmed life, the notion of someone else telling us what is safe, and what is not safe, is naturally abhorrent.

Infant school finished at 3pm. My sisters finished school at 4pm. Mum and dad would not be home, so I made my own way to granny’s house. I would arrive to find my grandpa, Willie McCann, sitting in his little hut at the back door of the house, smoking his pipe. Grandpa would knock out his pipe, and take a good grip on his walking stick. Together we would make our way into the kitchen where his wife Mary Anna, was preparing the evening meal. Grandpa had broken his leg when he fell into the gap between the staging and the hull of a ship he was rivetting. Thereafter he had never been able to walk without the aid of a stick.

Granny had been a farmer's daughter from Portsalon in County Donegal. On their marriage certificate, grandpa is euphemistically described as a farm labourer, like myself. In reality, the family name McCann declared grandpa to be a tinker. His lineage was, of course, reflected in his considerable resourcefulness and manual skill. It was no surprise that Willie McCann rose to become perhaps the most respected riveter on Clydeside. Travelling people have always been despised by the static community. Evidently Mary Anna and grandpa had eloped. In the Roman Catholic tradition, a marriage ordinarily takes place in the parish where the bride lives. I deduce that my great grandfather objected to his daughter marrying the likes of Willie McCann. Mary and Willie made their way to Letterkenny, where they were married in the Cathedral.

Uncle Charlie once advised me that the way to get work was to “*Follow the steel*”. If you see a train or ship loaded with steel find out its destination and make your way there. So it was that granny and grandpa came to Scotland and settled in Clydebank. Granny was a tiny woman and very much an “*Old school*” mother. She raised a large family without resorting to the modern fashion of outsourcing the responsibility. Mary Anna was proud to be the company director. She maintained absolute control of the organisation. Everyone in the family knew their role ... and their place! Willie McCann would settle into the big old armchair and throw some more coal on the already blazing fire, while Granny made some tea. I would stand dutifully at grandpa's side, waiting to play my essential role in the ritual about to unfold.

Grandpa took out his penknife with its well worn blade, and scraped the bowl of his pipe meticulously. Then he would lean forward and tap out the remains of tobacco and ash. The cleaned pipe was laid to one side. The next part was my favourite. Grandpa reached for his Condor Plug tobacco. The heavenly aroma of the solid dark oily lump was delicious. He would cut slices of tobacco from the block with his penknife and hand them to me. My job was to rub the slices in my hand to break them up. Grandpa would then fill his pipe and draw on it a couple of times. If he was not satisfied, another slice would be cut from the Plug and packed into the bowl. Once the fill was to his liking, grandpa laid the pipe down respectfully once more. Mary Anna did not permit her husband to smoke in the house.

The ritual was concluded by grandpa taking a match out of his box of “*Vulcans*”. With the stick end, grandpa would carefully lever his glass eye from its socket. He had lost his eye to a hot chip from a rivet. The glass eye was placed in its little box. Granny would then present grandpa and me with mugs of hot tea, and together we would relax watching the fairies dance in the flames of the open hearth. What a difference a pair of goggles and proper staging might have made to granny and grandpa.

I never knew my grandfather Cahill, other than from the large oval framed photograph of a man with a moustache whose eyes stared sternly at me whenever I was in the vicinity. Jim Cahill had been killed in a mining accident, attempting to meet production quotas working a difficult seam in the Nottinghamshire coalfields. He and his mate Stanley Moseley had been struggling to remove a large piece of coal. They were using a “*Ringer*” in an attempt to pull the piece out. Seeing that they were getting nowhere, grandpa decided to go to the opposite side of the piece of coal. While doing so, he was crushed by a second piece of coal which fell down on him. Jim Cahill died in hospital the next day from internal injuries. His workmate was a young lad. Grandpa knew the dangers of the situation and was not prepared to delegate the risk to Stanley Moseley. Jim Cahill’s gravestone occupies the most prominent position in the cemetery at New Ollerton in Nottinghamshire, perhaps reflecting the respect of the other colliers. The accident happened on 16th July 1934 when grandpa Cahill was 59 years old.

In 2002 my aunty Theresa Cahill was living in a nursing home at New Ollerton when she received a visitor. The person introduced himself as Stanley Moseley. He wanted to apologise for her father's death. It turned out that Stanley's mother had not allowed him to attend Jim Cahill's funeral. Stanley Moseley remained angry at being prevented from paying his last respects, and felt he should have been the one who was killed instead of grandpa. Like so many who find themselves in similar situations, he had carried the burden of “*Survivor guilt*” for nearly 70 years.

No apology was necessary. Jim Cahill was the senior man and made the decision. His decision was the only one a decent human being could make in the circumstances. The guilt belonged with the colliery. Nobody should have died that day. Production should never take higher priority than a worker's life.

When I was young, there was a large warehouse fire in the centre of Glasgow. The building collapsed, killing a number of firemen. Those killed had been on a floor beneath the blaze. They were spreading tarpaulins over the furnishings to prevent possible water damage when the building came down on them. The insanity of the situation was only recognised in hindsight. Thereafter it became policy that no fireman should risk his life trying to save property.

As a schoolboy I spent many Saturday mornings at the Glasgow School of Art, - not that it did me any good. In June 2014, the Glasgow School of Art caught fire. Media reported that firemen entered the building to tackle the blaze. The reason given was that the Charles Rennie Mackintosh structure has great symbolic value to Glaswegians. That might hold for some, but don't count me amongst them. It was an ugly building. Charles Rennie Macintosh was no bricklayer and he never paid for the School of Art out of his own pocket. The structure was scarcely a good example of Macintosh's best work. If Glaswegians wanted to honour Macintosh, they should have selected one of his better architectural designs and constructed it in attractive surroundings. Identifying a less flattering location than Garnethill for the Glasgow School of Art would represent a challenge to the meanest planner.

However, before the smoke had even cleared, the UK Government announced that it would allocate millions of pounds to restore the damaged building. The motivation in Westminster may have much to do with the impending referendum on Scottish Independence. Whatever the reason, the taxpayer should not be burdened. The School of Art is part of Glasgow University which has wealthy benefactors too numerous to mention. The structure and its contents would have been fully insured. This begs the question: Was the fire chief induced to send his firefighters into that building to mitigate property damage for the benefit of some insurer? When profit confronts safety, the latter seldom emerges unscathed. There is another more important point to bear in mind. If any firefighters had been killed in the blaze at the Glasgow School of Art, it is virtually certain that neither the government nor any insurer would have given the slightest thought to the dead or their relatives.

History teaches that nothing is learned from history.

I was born in The Crescent, Dalmuir, near Clydebank. Our front door looked across to Dalmuir Station. While waiting for my big sister to take me to school in the mornings I would clamber up on the low wall which separated the station property from the road. Grasping the railings with my face firmly lodged in the gap between two adjacent stakes I would watch the huge LMS monster waiting at the platform hissing impatiently. With its blower whooshing, and great clouds of smoke billowing from its funnel its agitation increased. Sometimes it became really angry and snapped its safety valves wide open with a snort. "*Hurry up you lot! I've got places to go!*". If the driver didn't handle his spirited steed carefully it would spin its wheels in its determination to shrug off its stationary condition. No sane young boy could fail to be enchanted with the display, accompanied as it was by smoke, steam, sparks, and the gorgeous aroma peculiar to those beautiful coal fired beasts of burden. If I was lucky the driver would give a blast on the whistle as the show began. All too soon the train would disappear from view and it would be time to make my dreary way to the pointless drudgery of school.

Then the day came when the line was to be electrified. I was perhaps six years old by that date. There were no more morning displays, and a temporary footbridge made of scaffolding was erected across the line. The old stone arch bridge which carried the road did not have sufficient headroom to accommodate the catenary wire, so it had to be replaced. My favourite vantage point at the railings was replaced with an aerial view of the work in progress from the temporary footbridge. In the distance was the familiar sight of the magnificent Singer factory with its great clocktower. Demolition of the old bridge which carried the road was accomplished using a cracker ball. The job was nearly complete, and I watched as the cracker ball was dropped once more. Nothing moved. Three men made their way forward to re-attach the cracker ball and all hell broke loose. The section of bridge collapsed taking the men with it. Two of the men never moved after they hit the ground. The third seemed to stagger back against the side of the archway. Rubble was still falling around them. Within seconds other workmen appeared from nowhere, clambering down the embankment to offer assistance.

Ours was the biggest nearby house, and one of the workers went to the front door. Shortly afterwards he emerged carrying blankets. Perhaps three families were devastated in that instant. The fall was no more than 20 feet. Nevertheless the probability of surviving that drop is low. Cracker Balls are a thing of the past, but simple forethought and good work practices could have prevented the accident altogether.

Few children are likely to comprehend how little it takes to end a life. I did not grasp the full magnitude of what I had witnessed. About 300 yards from Dalmuir Station, where the line passes alongside the park, there is a memorial to an accident which happened many years earlier. A poignant image on the plaque shows a man trying in vain to save a young child who had been playing in the path of an oncoming express train.

Young people believe they are bulletproof. I've done my share of risk taking, and I've had a good few close shaves. In my mad motorcycle youth, I was often told that I would kill myself. It was quite a tiresome mantra. In hindsight I realise that the people who chanted were really wishing I would be killed. I'm delighted to have disappointed them.

Back then, learning to drive a motorcycle was an extension of learning to drive a bicycle. The principle was to keep falling off until you learned how to stay on. There were no theory tests or supervised riding sessions. Driving a motorcycle seemed so natural to me that I couldn't imagine that anyone would have much difficulty getting the hang of it. The helmet law had just come in, and we bikers resented it heartily. Dave had long hair, and was in the habit of going for a ride to dry his hair after a shower. Dave would first light a cigarette, then drive off. The fag would glow with increasing brightness as he accelerated away. It was a kind of optical speedometer. By the time Dave had travelled a couple of hundred yards, the cigarette was burnt down to the filter. Dave hardly got one drag out of the thing. The helmet law was a downright violation of Dave's Human Right to dry his hair in the manner he chose!

My hair was a bit shorter than Dave's, and perhaps I didn't wash it as often as he did. One way or another, the helmet law was mostly annoying because I had to carry a spare helmet for the pillion. I didn't like the Scottish cold weather around my ears, so wearing a helmet was a good way to keep the elements out. I came off my bike more often than I would have done if I'd been given a little bit of guidance. However, I never seemed to hit my head. I certainly skinned my knees, hands, legs, and backside, but only once in all those miles did I strike my head. That was side on into a kerb at high speed. The helmet was smashed, but it did its job. I was one of the lucky ones. There was always that fraction of an inch of clearance which separated me from an alternative ending.

There is no "*Health and Safety at Play*" Act. On the other hand, when at play there is no imperative to do dangerous things. Seeing dodgy setups in one or other of the recreational engineering magazines irritates me. People pay good money for these magazines and look to them for advice and guidance. If an editor does not have the competence to make an objective assessment of the stupidity of an article, he or she should buy in the expertise or resign in favour of someone who has appropriate knowledge.

One such setup showed the use of edge clamps holding several workpieces on the periphery of a faceplate. The assembly had the appearance of a prototype rotary Claymore mine waiting for an opportunity to explode. To make matters worse, pieces of vinyl, a horribly compliant material subject to a high degree of creep, had been interposed between the workpieces and the faceplate. This limited the effective clamping force, guaranteed a total absence of precision, and worst of all, provided potential for a tool to “Dig in” and detonate the ordnance. The setup would not even have been considered safe by turners from 150 years ago.

Rigid work setups are part and parcel of a “Right job”. They speed production, improve accuracy, and increase operator satisfaction. The latter advantage may only be appreciated by people who care about quality. However, rigid setups also reduce tool breakages and “Wasters”. Most importantly of all, rigid setups improve safety. One author made the point that when constructing a model, every component should be treated as though it was a project in itself. Making a component then naturally encompasses the manufacture of tooling, jigs, and fixtures. Adopting such a philosophy frees the model engineer from any desire to cut corners or settle for “Quick fixes”. The payback comes in the quality of the finished work. Workshop capability is also extended by well made tooling manufactured in the course of model construction.

I would not want anyone to think that I have the slightest sympathy for those who injure or kill themselves when engaging in their chosen recreational activity. Stupidity and self destruction are valid lifestyles in modern Western “Culture”. Suicide appears to be quite fashionable nowadays. One often hears the expression: “They died doing what they loved”. One might add: “Good enough for them!”.

Injury or death in the course of daily employment are *altogether* different. So too is the matter of “Collateral injury”. The problem is that people who are sloppy or suicidal, but have lucky escapes while “At play”, are prone to create dangers for others in their employment by taking their attitudes into work. Many commercial aircraft have been crashed either deliberately or through carelessness. I have never yet heard of any machine which apologises for its behaviour. “Accidents” are very intelligent and resourceful things. They are always on the lookout for somebody to make them happen. The integral nature of the human contribution has quite correctly led to a preference for use of the term “Incident”.

I regard dangerous setups like the rotary Claymore mine, in terms of an examination question in Physics or Engineering...

Q6. DYNAMICS, PROPERTIES OF MATERIALS & BUSINESS STUDIES

“A lathe is rotating at R rpm. A workpiece, weighing Xlbs, becomes detached from the faceplate at a radius of Y inches when at an angle of D degrees to the horizontal. The operator, standing in the plane containing the path of the projectile and at a distance F feet from the axis of the lathe, weighs Mlbs. The projectile collides with the operator's head and remains embedded in it.”

A. Determine:

- i. The total kinetic energy of the erstwhile workpiece.
- ii. The equation of motion of the projectile.
- iii. The time interval between separation of the workpiece and impact with the operators head.
- iv. The equation of motion of the workpiece and operator combination.
- v. The probability that the operator will be alive after impact.
- vi. The loss in productivity measured in financial terms.
- vii. The total downtime resulting from the incident.
- viii. How long it will be before medical assistance arrives.
- ix. If the operator survives, state the likely medical complications resulting from intervention.
- x. The magnitude of the Insurance claim.
- xi. The probability that the Insurance company will meet its obligations under the policy.
- xii. Legal Counsel fees of both sides combined playing “Tennis” with the case. (To nearest £M)
- xiii. The findings of the Health and Safety Inspector.
- xiv. The value of the contents of the said Inspector's “Brown envelope”.
- xv. The number of years which will elapse before the legal action is resolved.

15 Marks.

B.

Calculate how long it would have taken to set the job up properly instead.

50 Marks.

C.

In no more than 300 words, discuss the merits and disadvantages of sloppy operators in the workshop environment.

10 Marks.

The rotary Claymore mine purported to illustrate a “*Quick*” way of doing the job. Even assuming the operator survived the process, it was actually a very long journey for a shortcut. The shape being made was almost identical to that of a “*Stevenson Link*”, but without any of the really difficult operations required in the latter component. There is no shortage of excellent books on workshop practice which describe safe, rigid, and precise methods of manufacturing components like Stevenson links. (e.g. *Model Locomotive Valve Gears*. Martin Evans. www.teepublishing.co.uk)

There are those who profit from the requirements of Health and Safety legislation. The manner in which the Legal Profession and Financial Services organisations have capitalised on Health and Safety issues is just plain disgusting, but not surprising at all. Others imagine risks where none exist, creating expense and inconvenience to serve their own ends. It is precisely because of unjustified interruptions and shutdowns, that any normal, well balanced, reasonable individual, feels their hackles rise at the mere mention of Health and Safety.

On the other hand, despite their infuriating nature, safety regulations and precautions can be beneficial. I might have discovered the importance of wearing a crash helmet when I hadn't been wearing one. Had it not been against the law to drive without a helmet, I wouldn't be alive today.

“*Old Hands*” are familiar with a bit of risk taking. Gaining that experience should never be based on luck.

The first duty of a model engineer is to end the day without injury.

Jim Cahill

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