The Raw Recruit

There has been a great deal of effort expended in trying to encourage new entrants to adopt model engineering as a hobby. A significant proportion of the effort has been focussed on encouraging young people. On the face of it, this seems a rational approach. It is akin to providing incentives to encourage girls, or people from ethnic minorities, to adopt careers in which they are statistically under represented. Undoubtedly some individuals from these groups will be quick to grasp the incentives, but when the incentive no longer applies they will find pastures new. It is a truism of Human Nature that few people appreciate those things which they do not have to earn for themselves.

There is no doubt that since the earliest formal establishment of model engineering clubs and publications, it has been older people who have represented the majority of active model engineers. It has been argued that since older people have a lower remaining life expectancy than young people, the hobby must decline. Yet model engineering continues, and young people remain in the minority.

Justifications for specific socially coercive actions, based on perceived statistical anomalies, are inherently unsound. Girls remain a minority in engineering and physics, despite more than 30 years of aggressive marketing, recruitment, and incentives targeted at girls. The reasons are probably equivalent to those which result in boys remaining the minority in areas such as primary school teaching and biology. Boys choose careers which they find suitable and girls do likewise. Take the horse to water if you must, but if the horse isn't thirsty, expect to feel very silly over the wasted effort.

There may at one time have been social pressures inhibiting career choices, but by the mid 1970s, as far as the UK was concerned, such pressures had all but disappeared. It is possible that Soviet propaganda, dating from the mid 1960s was a key component in persuading the West to adopt the massive gender biased recruitment effort which began about that time.

Russia had of necessity co-opted everyone, man and woman alike, to reconstruct their nation after the devastation of the Second World War. However, Russia turned Soviet necessity into a virtue. The selection of Valentina Tereschova as a Cosmonaut was a master stroke of political genius. If a girl could be a Cosmonaut in the USSR, social development there must be more advanced than that in the West! The West swallowed the propaganda - hook, line, and sinker. They completely missed the point that Valentina Tereschova was not the most competent Soviet girl Cosmonaut, simply the most attractive one. The West is a fool for a pretty face - and it shows! It was only after the disintegration of the Soviet Union that the existence of dozens of orphanages emerged. It begged the questions - If everyone is fully occupied pursuing their career, what becomes of families? When families disintegrate, what kind of social structure remains? Without social structure, can any nation hope to sustain itself? We'll see. "Liverpool Care Pathway?" *WHAT!!* Is there something wrong with the use of traditional terms like for example starvation, dehydration, hypothermia, neglect, abuse, or murder?

It seems these things are socially acceptable because they are carried out in Institutions by people with professional status such as "*Doctor*" or "*Nurse*". Of course, the medical profession has always been represented in the forefront of atrocities, from Jack the Ripper through Hitler's death camps to Dr Harold Shipman and the present day.

Understanding causes is far more difficult than generating statistics. That may be one reason why policies tend to be based on statistics. However, since statistics do not reveal causes, policies which try to "*Correct the statistics*" are devoid of rational foundation. Old age pensioners are undoubtedly under-represented in the Olympic 10,000m event. Is it then reasonable to expect that by providing incentives for OAPs to train for this event, that their statistical presence will be significantly altered? I suspect that adoption of such a policy would merely result in a roaring trade for undertakers.

Our sons, who are all active in engineering and related activities, have neither time for, nor interest in, model engineering. If it can be bought, why make it? If it can't be put to work earning, why buy it? What difference does it make if a hole is a few thou out of line? Drill it through clearance, get the job bolted up, and put the machine back into service. If you don't have the right bolt, drill it out and tap it for one you do have. Then, of course, there's always the plasma kit, burning torch, and MIG. What do you mean paint it? (Photo 1) Leave it alone or do a "*Right job*" and send the lot for "*Galving*".

Photo 1. Bill unfolds a land leveller which Mike had just designed and built for a customer who was too mean to have the job galvanised.

These lads don't have time to be stuck for a 2 BA bolt. Any attempt to recruit my sons - who have talent and an active interest in engineering - is effort wasted. Their comments in respect of the model engineering magazines pull no punches. Technical aspects of the models themselves are likely to arouse interest. However, the inclusion of people in the photographs spoils the effect. Our sons know what people look like. They see people every day of the week. In any event, it makes no difference what the modelmaker looks like. When it comes to the modern Professional Engineering magazines, the lads' comments are vitriolic. Projects like the JCB Deiselmax, Bloodhound SSC, and the Virgin Challenger, are just ego-tripper's toys. Given the enormous resources these wealthy individuals have at their disposal, can they not find something useful to be doing?

Difficult as it might be to interest sons like ours, it is well nigh impossible to recruit young people who have been presented with every opportunity to study technical and science subjects throughout school, yet have displayed neither interest nor aptitude. There is little prospect of success when trying to compete against an all pervasive media which focusses minds, young and old, on their bodies, their image, and all the instant gratification that money can buy. Observation of people, the things they buy, the way they dress, the manner in which they act, and their subjects of conversation, can give some inkling of the things that they might consider important in their lives.

In my own case I was well aware of model engineering as a young lad. I was an active model maker. The types of things which occupied my mind were Meccano, electronics, plastic kits, (mostly of ships), 00 gauge model railways, and model boats. I tried my hand at making model aircraft, but without much success. When I was 12 years old, I bought a "James" motorcycle for sixpence. It was well rotted, but I just wanted the Villiers 98cc two stroke engine with its integral two speed gearbox. I think the engine is still lying around somewhere. During second year in school, the maths teacher suggested I enter the Glasgow Schools Science Competition. I picked the team, and defined the project. We won second prize.

It was all our own work, - bar nothing. We bought the materials out of our own pocket money. First Prize went to Allen Glen's school, but that was to be expected. One entertaining experience from school was when I built an electric shock machine. I had the shock machine in my schoolbag with a couple of wires and 5" Meccano perforated strips hanging out. I caught a few of my friends with it. The whole class had a good laugh.

Outwith school, I attended many steam days of the Glasgow Society of Model Engineers (GSME). I visited their club workshop once with my dad. The workshop was on the ground floor of an old tenement in the Partick area of Glasgow. I think the premises had been a shop at one time. I recall seeing a lathe and a timber lagged test boiler. The place was cluttered and gloomy. The floor was uneven, and I suspect it was only a matter of time before the lathe joined the rats in the basement below. I recall dad having a discussion with one of the club members regarding the possibility of using the workshop.

The club operated as follows. Once a job was set up in the lathe, it would not be removed until a suitable point in the machining operations had been reached. Consequently, once one person started using the lathe, it might be some time before another person could have access to the machine. If the second person was not around at the changeover time, then the first person would simply mount the next job rather than leave the lathe idle. Given the uncertainty in the duration of machining operations, it was a foregone conclusion that one person would dominate in the use of the lathe. It was not a workable arrangement, particularly for a newcomer who would also need someone present to offer guidance.

We never returned to the clubhouse, although we continued to attend track days. These were mostly held at the Rolls Royce workers' social club in Crookston. There was a mixed gauge raised track constructed round a football pitch which provided an excellent workout for the locomotives. There was also the occasional visit to the village of Balfron, North of Glasgow. A club member had a ground level track there, which I think was 10¼" gauge. It was a beautiful country house setting. The locomotives themselves were truly impressive, and the sun shone whenever we were there.

My next door neighbour was a professional photographer. He had a Myford lathe which he used to make components for his various cameras. I still have some of the lenses he gave me. Dad had given up teaching science to retrain as a technical teacher. He paid for materials out of his own pocket in order that his pupils could construct a Springbok locomotive in the school. Dad was timetabled off metalwork and the project stalled.

The materials and partly finished components were brought home, dumped in a dilapidated lean-to with a leaky roof, and left there to rust. Dad had managed to obtain copies of Model Engineer, some of them bound volumes dating back to the pre-war years. They lay in boxes up in the loft, providing accommodation for mice. My father had also purchased a very small home made lathe from one of the other GSME club members. Centre height would have been about 2" and the distance between centres was perhaps 12". It had no compound slide, but was fitted with back gear and came with a set of gears for screwcutting. Dad covered the lathe with an old raincoat, and it joined the Springbok on the journey to Iron Oxide. It was never suggested that I might like to pick up working on the Springbok where the pupils had left off. Things might have been different had dad made that suggestion, but despite my exposure to model engineering, it never really captured my interest.

In 1970, a new Myford Super 7 could be purchased for £168. I never bought a Myford with my money that year. I paid £275 for a Revox A77 tape recorder. In 1982 the same Myford lathe cost about £1,000. I never bought one then either. I used about the same amount of money to purchase a second hand Norton Commando, putting it in the garage beside my Triumph Trident, and BSA Gold Flash. The following year brought change. On that occasion, when I didn't buy a Myford, I spent £1,000 on my first Digital Equipment PDP8 mini computer. Evidently money was not much of an obstacle to the interests I pursued. It seems I also had an ample supply of time to indulge in my chosen activities.

I purchased my first machine tools in 1985. I had been given a contract to design and make a pair of precision sample manipulators for a company which manufactured scientific instruments. Many of the components were bought in. The customer was utterly supportive and made certain other complex items. However, there were small components, the design of which could not be finalised readily. I realised that using subcontractors to implement my designs would be unsuccessful, largely because of lead times combined with the almost certain need for modifications.

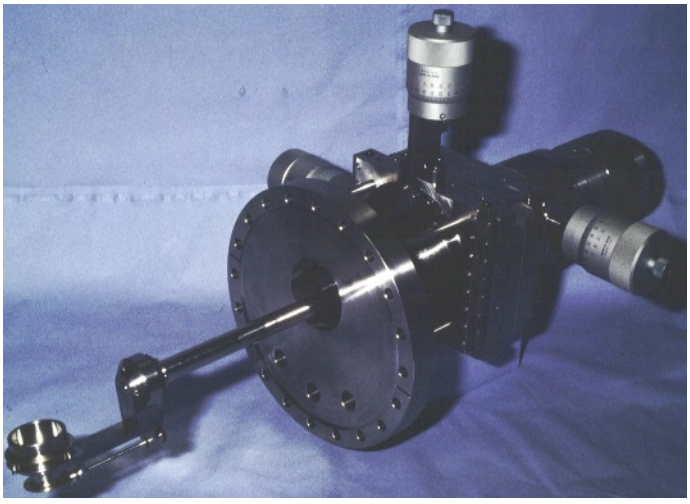

Photo 2. The Ultra High Vacuum sample manipulator which I designed and for which Robert made many parts. The equipment gave 2" movement in the XY plane and 3" along the Z axis. This latter consisted of 1" under micrometer control and 2" coarse adjustment. The manipulator also gave two continuous rotational degrees of freedom independent of one another.

Anyone who suggests that "*Right first time*" is a design reality ought to be regarded with considerable suspicion. To provide the machining capability, I bought a Cunllife Universal Mill and a Colchester Triumph lathe at a liquidation auction. It was a fortunate purchase. The man who had owned the company struck up a conversation with me. He advised me to ignore the other items in the auction and bid on the mill and lathe. The Cunllife was his favourite machine. If I was to choose one machine, it should be the mill. His view was that there were few jobs which could not be done on a universal mill. After the auction, he explained what the various attachments were and made sure that I took away all the smaller items there and then to prevent them going "*Walkies*".

Back home, the car was evicted from the garage at the side of the house and the mill and lathe took up residence. It was a dark, claustrophobic environment, reminiscent of the GSME workshop. It did, at least, have a solid floor. The garage door had to be left open in order to feel able to move at all. This made operations somewhat uncomfortable in Winter. During the Summer months, the arrangement worked well. Our hillside location afforded a wonderful view over the Firth of Clyde, to Arran and beyond. On a clear day it was possible to see the hills on Mull about 50 miles away. I employed a young lad to assist in the construction of the sample manipulators. In the event, I settled to design while Robert settled to production. I only made a few of the parts. The finished manipulators were delivered in the nick of time, to the delight of the customer. (Photo 2.)

At that point I was informed that the company employees had been running a book on me. The drawing office chief made a handsome profit. It transpired that *all* the major manufacturers of scientific equipment in the UK and America had declined to quote for the sample manipulators.

The specification was too demanding. Robert and I had achieved a few "*World firsts*" with the design. In due course the manipulators were installed on their instrument and made their way to "*Argonne*", one of America's foremost National Research Labs. Not bad for an old Cunllife and Colchester.

Having become the owner of machine tools, and having seen what they were capable of producing, there was no going back. I had come to share the previous owner's affection for the universal milling machine. I may not have made many of the parts for the manipulators, but a machine shop had become an indispensable part of my life. Nevertheless, model engineering did not draw me. In an attempt to interest my young sons in the joys of engineering, I commenced the construction of a Stuart Double 10 engine. (Photo 3)

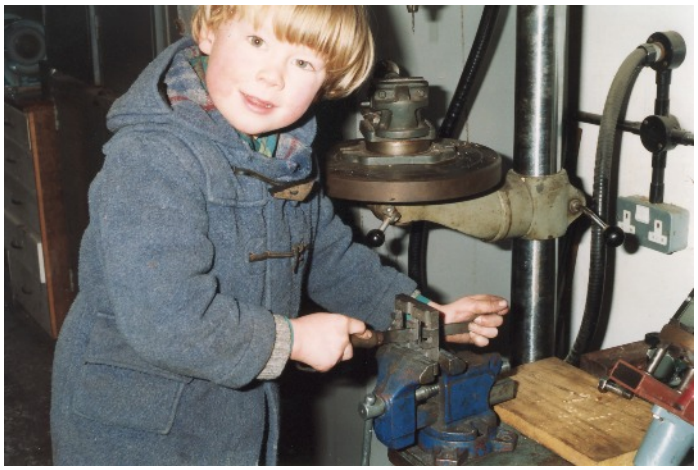

Photo 3. Young Jim pauses for the camera whilst fettling the engine bed casting for the Stuart D10. His early enthusiasm waned rapidly.

The boys derived more pleasure from making engineers' clamps out of scrap metal I had. It gave them the use of the shaper and pillar drill. It was a job they could see through from start to finish. (Photo 4) For a time it seemed my sons couldn't make enough toolmaker's clamps. I ought to have developed their interest along the lines of toolmaking.

More than twenty years later, the clamps are still in use. I carried on with the Stuart model for a while, but was unable to muster the enthusiasm to finish it. (Photo 5)

I also dragged out the rusty remains of the Springbok and spent some time on it. (Photo 6) Once again, enthusiasm was missing. In due course, both unfinished models were sold, as were the mouse chewed remains of the Model Engineer magazines.

Photo 4. Most of the toolmakers clamps my sons made are still in their personal toolboxes. This one had become a dropout. I found it living rough in a cardboard box in our old garden shed. Despite the unfortunate social circumstances to which it had descended, a bit of surface grinding and some oil was all it really wanted. It rejoined the workforce enthusiastically and has since integrated fully with the other clamps.

I doubt if I will ever be a true model maker. I hope the day will come when I am able to turn out components of the highest accuracy and with the finest degree of detail. However, something in me prefers that for a detail to be included, it should serve some specific function other than aesthetics.

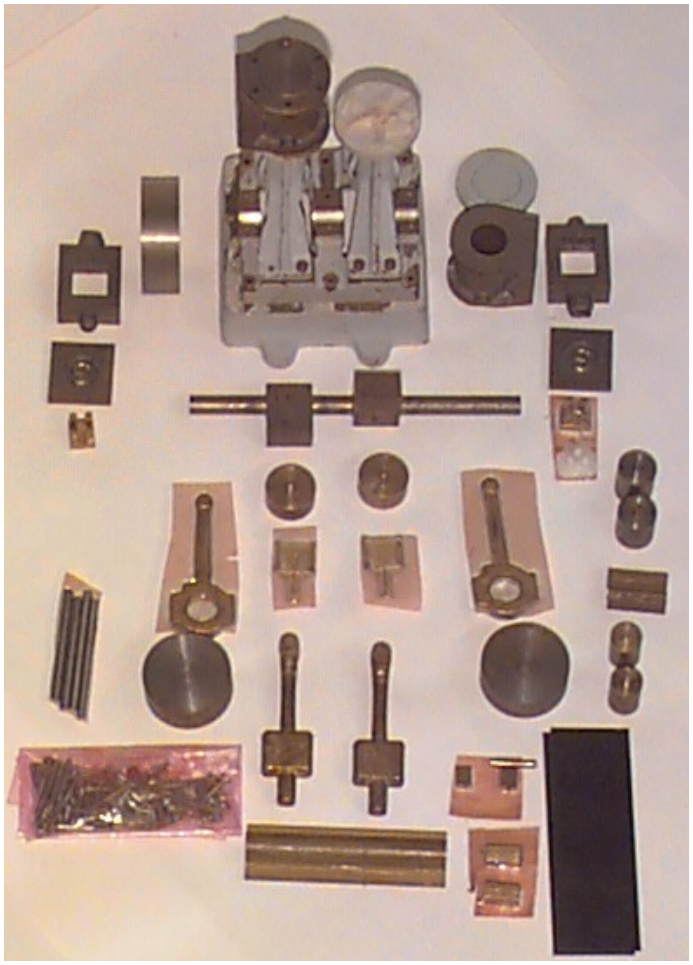

Photo 5. The Stuart D10 as it was sold. The bedplate, columns and cylinders had been machined along with the top cylinder covers. The valve chests and cover plates were partly machined. No work had been carried out on any of the moving parts.

That may be one reason I have found experimental work and toolmaking activities to be more suited to my nature. I enjoy reading about model engineering and have endless admiration for those who are able to turn out fine scale models. I find myself absorbed, comparing different designs of similar models. Attempting to assess advantages and drawbacks of particular configurations can be most stimulating. It was only a chance encounter which ultimately led me to appreciate the value of model engineering. Models appear to be toys, and toys are for children. Appearances can be deceptive, especially when engineering models are concerned. My workshop is an environment where the ratio of technical challenge to resources can be second to none. The sense of achievement from problem solving in my present circumstances overshadows any experienced in my life as an employee.

Photo 6. The components of the 5" gauge Springbok locomotive set out prior to sale. Many smaller parts had corroded beyond recovery and were discarded. The die holder pictured to the right of the cab side is the one item I retained.

My satisfaction is nevertheless tinged with regret. In the early 1990s I recruited a few staff to assist in another prototyping project. Funds were limited, and the wage I could offer was minimal. The people I selected were sent to me by the Government Training Centre which ran courses for the long term unemployed. Not one of my staff disappointed me. (Photo 6.) My employees never grumbled about wages, freezing working conditions, inadequate machines, or long hours. They seldom called in sick. If they did, there was good reason. The work was completed successfully. Good manners don't cost anything, and I liked to wish my employees happy birthday on the day. I went into the workshop to wish Alec many happy returns on his 52nd. "*Where did you get that idea Jim?*" said Alec. "*I'm 58 today.*" The Government training agency had deliberately given me an incorrect year of birth for Alec. They knew how prejudiced some employers could be when it came to taking on older staff. When the money ran out in 1992, I had to pay off my employees. They didn't want to leave. There was no other employment for them to go to, and they asked if they could keep coming even without wages. The money had not been the reason for their loyalty. The social structure which had grown up around the project, and the delight at having been given the opportunity to demonstrate their creativity, brought my staff to work every morning. For my part, I felt I had nothing further for my employees to be doing, and turned them away. However, the cost of operating the workshop itself was minimal. How much might all our lives have been enriched had I only thought of letting my erstwhile staff work on the Springbok or Stuart for their own satisfaction?

Statistics can be useful if they are accepted as a concise summary of the way things are, rather than as a prompt to change the status quo. Every affirmative action is inherently prejudicial. An inefficient "*Minority driven*" recruitment policy is acceptable for any government which perceives its mission as one of undermining social services and squandering with impunity. In the case of a small club, the penalty for adopting such a policy might be ruinous. Statistics cannot reveal causes, but there *may* be no need to identify the causes which define personal actions. Taking the simplistic view that there is something about the characteristics of model engineering which matches the circumstances, interests, and abilities of older people, to a greater degree than it matches those of lesser years, is as reasonable an approach as any.

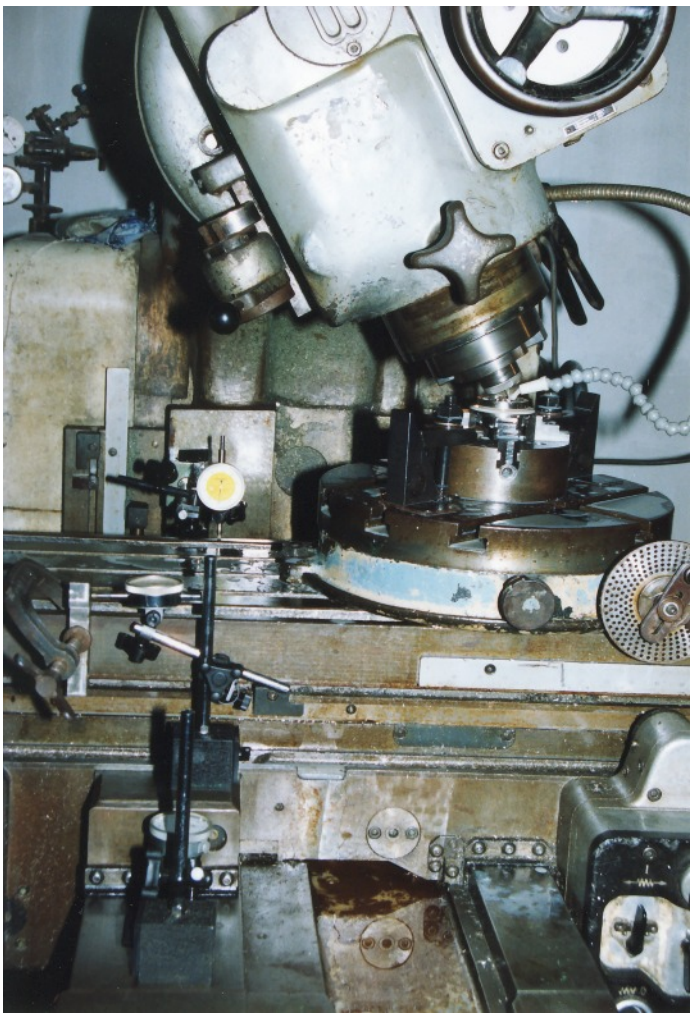

Photo 6. An interesting setup on the Fritz Werner mill. The component was an inlet duct with 3 webs which required an approximately conical central form. The work involved a combination of accurate rotation on the dividing table, precise movement of all three axes, and different angular settings of the head. This was not a job for beginners. Alternative construction methods would have been employed for production purposes. However, I mentioned to Alec that it was possible, at least in principle, to make the component on the mill. Neither of us could resist the temptation. I prepared a sheet of movements which Alec implemented with the most painstaking dedication. The material was 316 Stainless Steel. Alec made two of these components without any mistake. That's what I call skill. CAD - CAM jockeys eat your hearts out!

If the majority of Model Engineers are over 60 years of age, then it is amongst people of that age group where new entrants to the hobby are most likely to be found. Recruitment efforts directed to older people are consequently likely to achieve the most cost effective response. I would never refuse a welcome to any interested individual. However, if one is determined to recruit younger members to a Model Engineering club, then a rational approach would be to canvass amongst the age group 45 - 60 years. People who opt for early retirement in that age range will require something to occupy their minds for up to half a century in some cases.

Those made redundant in the same age range are never again likely to find stimulating employment. As a group, their life expectancy will be lower than that of their superannuated counterparts.

Some are likely to have an appreciation of the significance of friendship, and of loss. Individuals in such situations might discover that an activity, which may be adopted as a form of occupational therapy to restore meaning to their lives, develops into a source of endless fascination. Unlike the teenager, or person in their early 20s, older people have had an opportunity to develop hindsight.

To them, Model Engineering clubs might represent a valuable social asset, not merely somewhere to engage in vacuous "*Fun*".

Another reason for directing recruitment effort towards people in the age range 45 - 60 years, is that they are one generation closer to the youngsters on whom it is presently so fashionable to expend recruitment resources. Middle aged Model Engineers might present an image with which younger folk, like my sons, *might* associate themselves more readily.

Jim Cahill