Making things: Reflections of a model engineer

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Warning: parts of this essay should be read to the sound of a plaintive solo violin!

Just as policemen are getting younger (if you can find one) so model engineers are getting older. Many current practicing model engineers were, like me, born just before, during or just after the Second World War. It was a different country then.

It is a bit of a cliché to say that children of that era had to make their own amusement but none the less true. There were few toys as most went for export after the war. One consequence was that there was an incentive to make things yourself. Even the comics and children's annuals included articles on how to make things. We currently have a good number of young members in our club and, if the club is to thrive in the long term, they/you need to discover the joy of making things.

It really does not matter what is being made: model aircraft, boats, furniture, jewellery, tools etc. What is gained is an appreciation of materials, the hand/eye coordination and an understanding of how things work. There is a saying attributed to Confucius which goes something like "what I hear I recall, what I see I understand but what I do, I know".

With reliance on "cheque-book engineering" as it is termed in USA model engineering circles, the hobby in general and the clubs in particular have an uncertain future. I implore our young members (and their parents) to consider that tools and materials are a better investment of pocket money and birthday/Christmas presents than ready to run toys. Furthermore, advantage should be taken of the advice and experience of the older members whilst it is still there.

I remember my first attempts and making things at the age of six or seven. No Lego then, though a few years later my older brother was given a second-hand Meccano set which I eventually inherited. (The smaller bits made a lovely noise as they went up the vacuum cleaner) The materials and tools available were bits of scrap wood, hammer, nails and saw. Here are a few examples that I can remember of my early years, making things.

Age six, nailed some bits of wood together to make a railway locomotive – couldn't find it and discovered mum had nailed the work in progress to her ironing board to stop the iron slipping off. (Never forgave her).

Age 7-8: fastened a clockwork motor from a broken pre-war toy to the bottom of a hull of solid wood and tin-plate propeller soldered on, catapult gun made from bits of wood, nails and strips of car tyre inner tube, Meccano when my brother wasn't looking. Then, in the 50s, balsa wood became readily available and model aircraft, both from kits and invented, were the main activity due to the simple tools needed. However, I did make a steam engine with a bicycle tube cylinder, a lead piston using a hand drill and file as a lathe. It ran with a tin-can boiler.

I then went to a grammar school where the only way to achieve approbation was either to be a good sportsman or to excel in classics or modern languages, neither my bag. However, one year an enlightened master decided to hold a model making competition. As I was then completing a scratch built 4 ft long scale model battleship largely made of balsa, fitted with a home-made electric motor (including Meccano bits). I entered it winning first prize (for my "house") and was then accused of having been "hiding my light under a bushel". With a break for university, I carried on making models predominantly boats and planes

including home-made radio control systems until my mid 20s when a colleague, friend and fellow aero-modeller Ray Dando started to build a ground level 3 /12 G railway. This was at the behest of his son Glyn, then a young lad, and with the encouragement of his brother, Gordon Dando, an antique dealer who also collected and dealt in live steam models.
This is railway inspired me to have a go and after much reading of old Model Engineer magazines and joining Bracknell Railway Club. My first four locomotives were all 3 ½ G. At the start, my tools were an old flimsy lathe for £10 (no compound slide or graduations) and a Black and Decker drill with a vertical stand. I was able to bore the cylinders in a slightly better lathe in our laboratory at work over lunch break. The key to success was a lot of reading and listening to older practitioners who had done it all before and at that with equipment only a little better than my own. Public running was mostly using 3 ½ G at that time.

A few years later a group from the Bracknell club, including me, formed to build a ground level, multi gauge railway at Heatherdown School in Ascot as The Ascot Locomotive Club. This project taught me a great deal and got the go ahead with Royal Approval in 1977; Heatherdown was the prep school where Princes Andrew and Edward attended and we put on a promotional exhibition of locomotives which was inspected by the Queen and Prince Philip and so the railway was built. The school was sold to the 'Licenced Victuallers' seven or so years later with plans to redevelop the site. Consequently, we had eventually to vacate the site in 1987 and after surveying quite a few options including Frimley lodge, which I had spotted being developed by Surrey Heath, the club opted to build on our current site with a break-away group going to Ascot Race-course. I surveyed and planned the railway we have now with the help principally of Charles Timbrell and Alan Priest.
The first point I am trying to get across is that the starting point for me and for other active model engineers has been "making thing" and the younger the better.
The second point is that you can start with relatively simple tools: saws, files, drill, a bench and a vice for example.
A third point is that model engineering differs from commercial engineering; Interchangeability is seldom so important so consider where precision is needed and use simple jigs to achieve fits. I sometimes think that trained production engineers can have a disadvantage when taking up model engineering; model engineering drawings are seldom if ever to the standards needed in industry. 45 years ago, I never imagined that I would design and build a close scale 7 ¼ G locomotive from scratch; don't be afraid to have a go but start with a reasonably modest project you can see the end of.
Finally, the lack of training and experience can have safety implications. When using machinery, loose clothing, lack of eye protection and poor work-holding are important contributors to accidents. To this I would add inappropriate hand protection. Wearing heavy gloves is not a protection when using a power saw. A glove may be dragged into a saw taking the fingers with it so better just see your fingers are out of the way. Even experienced machinists can have accidents through a drop in concentration. It is not unusual for millers and turners to have one or two damaged finger tips though this is all changing commercially with the advent of enclosed CNC machines. It can be more economic today for model makers to design components and to have them CNC, laser or water-jet machined than to buy castings to machine yourself. However, without first some experience of making things this is not an easy route.

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