"The Young Engineers & The 'Ellie' Project"

This document was written by Norman Rogers and Nicola Dellard-Lyle and was originally published by Bristol Society of Experimental Engineers in 2020

In 2020 Norman wrote an article about two junior members building Stuart engines in the Ashton workshop with help and guidance from some helpful BSMEE members. It was planned to provide regular updates, but Covid intervened, and that particular project died. However, all is not lost because we now have a new group of junior members so it's time to share something more with you.

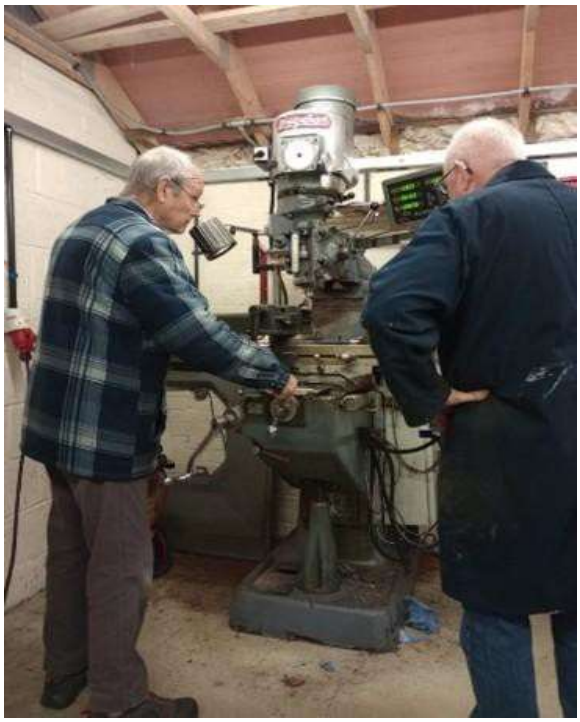
As many will know attracting new members is difficult, and attracting junior members is almost impossible. The industrial and leisure landscapes have changed dramatically since most of us were kids and the concept of making anything is getting lost. There have been various attempts within the hobby to try and address the issue but with variable results so how did we attract a new group of junior members?

Part of the story emerges from Derek Taylor and his 'meet and greet' activity in the ticket hallway at the railway where he displayed a locomotive and other artifacts and chatted with people about their interests etc. This resulted in a number of applications for

membership including family groups which in turn lead to a number of new junior members. That then raised a question, or perhaps a dilemma, what can the Society do for them beyond the obvious attraction of the railway? A project was needed, and inspiration came from Alan Bartlett and Derek Taylor … let's build an 'Ellie' steam tram in 16mm scale and not just one … but one each!

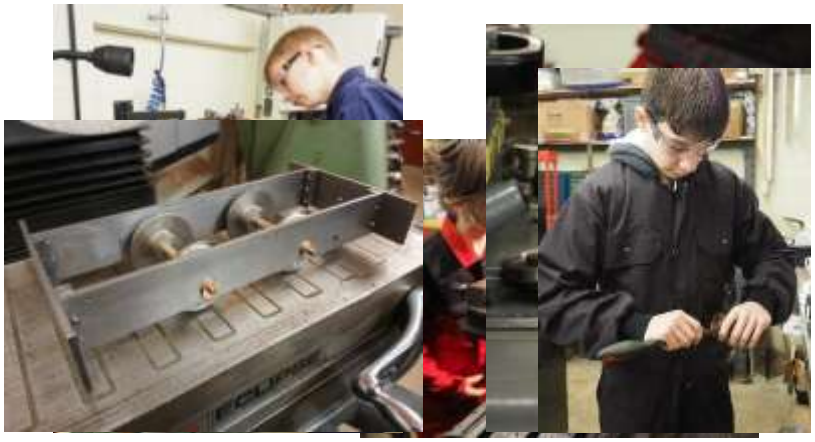
Tom is with us from the original project and has been joined by seven junior and three not-so-junior members in the re-launched junior's workshop. Workshop sessions are held every Saturday with the Society providing all materials and workshop support for this. To complement the project the garden railway is being modified to create additional running space.

To aid manufacture Bernard has produced component drawings and both lathes and the mill are fully utilised during each session. Fortunately, two of the machines are DRO fitted so working in metric isn't too difficult for those brought up on imperial, but an agile mind is still required - it seems easier to go wrong in metric!



As might be imagined there was an air of trepidation on the first day. How would it go? The workshop environment must have seemed quite intimidating for the junior members along with the jargon and terminology being spoken. As "seasoned" model engineers we're comfortable with most of that; we're also used to making mental calculations as we work, but this is a new world for the junior members so it's very important to go at their pace, understand what they think of it all, what they talk about afterwards, do the processes made sense? We'll hear from them shortly.

Construction of the model follows well established practices. The frames were marked out and cut from $^1/_8$" mild steel plate and held together with corner posts and buffer beams. This exercise provided an immediate introduction to materials, measuring, marking, sawing, turning, milling, filing, drilling, riveting and tapping. The 8BA taps made it without a single breakage and no fingers were lost!



Axles are 4mm silver steel running in bronze bearings and the wheels were a multi-stage process from a billet of mild steel.

Early February witnessed chassis building almost complete, cranks and coupling rods remaining to be done. The engine unit and gear cutting were being prepared for, and boiler work got under way. Rob Norbury built the pilot boiler in January and by the end of February quite a number were almost complete and ready for inspection by the boiler tester!

So, that's the story so far from a model engineering perspective however there is always another story to be told, as Nicola shares with us now:

As blue, black and red clad figures bustle into the workshop we all see faces awash with curiosity, excitement and maybe a little trepidation. The start of the 'Ellie' project was a brand-new venture for many of those involved. Yet another offering from the Society, this project brings a whole new element of interest for these young members as they try their hands at engineering in a comprehensive workshop.

Despite this being new ground to explore, it was clear from the start that the project would be a success on so many levels. And how could it not be- there is always an air of warmth whenever we arrive…of course this Winter has frozen us from the ground up, but that hasn't stopped the smiles and laughter(or the flow of tea and coffee!).The welcoming faces and brimming knowledge of the instructors has, week on week, inspired our children to return and to learn. Nothing holds them back, not even the incredibly unique way they are all suddenly able to learn - very hands-on, with clear instruction and plenty of (if not complete) independence now the students' knowledge of the machinery is growing and growing.

There is often a lot of quiet concentration in the workshop, alongside the buzzing and occasional screeching from machines. It is wonderful to see the level of interest and determination from everyone involved, with hours spent in a morning or afternoon dedicated to one seemingly small element of the project build. Only children (and adults alike!) who are loving their work and are comfortable in their environment are able to put so much dedication into such time frames. It is both a learning process and a sense of deeper settling of what they truly love. So, as we parents observe the work being done, we are noticing the quiet joy, too.

A milestone for many of the young engineers has been the assembly of their Ellie chassis. Something that is really beginning to look the part and can even by moved along on the Ashton Court Railway model track."I did it!" - words spoken with the utmost pride from grinning lips, as youngster's hands securely cradle their creations. Tiny pieces of metal crafted afresh from whirring cutting machines, which they are only just (if quickly!) getting to grips with, and all pieced together with such care.

Those landmark days saw numerous wide grins and exclamations of pride – from participants and volunteer instructors – and we know there are many more of those days to come, because this is a long-term project and the children are all here for it.

Parents and Grandparents have all watched in awe at the amazing progress these young engineers are making. It is refreshing to see the confidence that is growing in many of the children, whilst using techniques and mental skills that are brand new for them. The thing I have continued to notice since the Ellie project began (and overall, since our family became BSMEE members) is the natural way all of the skills being learnt are spreading into other areas of life and being translated across the board – now that is where life learning, hands-on skills and immersive social experiences show their impact … and of course, it helps when the people in question really, really love what they are doing!

As was said earlier this is really about what the Society can do for a group of junior members and their supporting family so what do they think of it so far?

“I really like the Ellie Project because the skills I’m learning will be really useful for the future. I’m getting experience of reading drawings and using machines, which I find really interesting. Making my own Ellie tram will be a real achievement.”

“I really like the Ellie Project because we are making our trams from scratch, which is more interesting than building something from a kit. I enjoy learning how to machine parts - which I’ve never done before. I also enjoy learning about the metals we are using and how each one feels different to machine.”

“I’ve really enjoyed learning loads of new skills. It’s been really fun learning about the tools and machinery. I like that I can have a piece of metal at the start of a session and by the end I can see how it’s going to be part of my Ellie tram. I think that’s why I really enjoyed putting together my chassis. The tutors have been amazing, they explain everything really clearly, they make it interesting and

fun. Thankyou very much.”

“It’s fun learning how the machines work, like the lathe and milling machine. It’s interesting finding out what they do and how to set them up and use them. I like that I’ve made all the different parts of the engine not just bought something and put it together.”

“It’s a really fun project and it’s been great learning how to use the machinery and getting to know the engineers. It’s very satisfying starting to put together the parts that I’ve made, I have particularly enjoyed making the boiler. I am very excited that I will have my own working steam engine that I have built.” During this project it’s been really interesting learning how all the different machines operate and allowing us to create the necessary components to build this little engine. When starting this project I didn’t realise how much work was needed to get a loco to the stage of a functioning engine, it’s been an amazing opportunity to be involved in this and has given me some experience on tools and machining practices which I’ll be using in my future career. The mentors have been amazing helping us and giving up their time to allow the Younger generation to understand more about the creation of steam locos and the amount of work that everybody puts into them. I’m really grateful for all the opportunities and help that has been given during this project and I can’t wait to see the 10+ Ellie’s all Together on the 16mmrailway.

A parent writes:

What a wonderful project. We have loved seeing our son’s confidence grow and how proud he Is of his achievements. We feel incredibly lucky to have this opportunity for him to learn all these skills, and to spend time with such experienced engineers. He is so inspired by it all and it has further fuelled his passion for engineering. It’s a highlight of the week.

We are so very grateful for the huge commitment given to this project, for Alan for all his work on the logistics and for the tutors who are so committed and patient. They give such a good balance of showing how to do something and then allowing the kids to do it themselves. And it’s been very enjoyable for us too to be part of this wonderful community.

And from Alan Bartlett:

As the initiator of this project I am thrilled that it has progressed so well. Everyone involved has been giving positive feedback and I thank all the tutors that have given their time freely.

And from us:
Alan you seem to have got this just right! All photos accredited to the Ellie project members