1st Storyworth A: What were your favorite toys as a child? ADDENDUM

After I had written the first few of these, it occurred to me that my first had completely overlooked something which should have been reported on. As I told my granddaughter, I have never met an engineer who did NOT have a model railroad set, because they were an excellent way to start to learn basic mechanics and how things work. Since the introduction of the smart phone, I cannot say whether the physical touching of model trains and the like will prove as valuable to her understanding. But I hope so ;-)

For the vast majority of people, the most popular are the O and HO gauge, which can be easily differentiated by the number of rails on the track; 3 and 2 respectively. I never had an HO set, and when I had them the tracks of an O gauge set were really not much like an actual scale model of real tracks – the span between railroad ties would collapse under the weight of the first locomotive which rumbled over them. HO was a better representation, and in fact those are the favorite for collectors, very few of whom are children anymore.

Mine was a rudimentary setup, since I had only limited track with a pretty simple figure eight layout, and almost nothing in the way of ancillary things, like buildings and other scenery. Many collectors, however, make elaborate layouts, often comprising multiple rooms. And those with sometimes more money than sense, it seems, have setups which get to almost the ridiculous. I was reminded of that, and the cause of this addendum, watching a series from BBC called "David May's Favorite Toys", wherein he visits some professional and private such sites, and compares them with his own experiences, which were more limited like mine.

Most of my BBC exposure first occurred via PBS, and in fact one Masterpiece Theater series showed a reality which I am aware of, wherein a private individual, in that case the future Prime Minister during the early reign of Queen Victoria and Prince Albert, had an ACTUAL railroad, which was one of the very first anywhere, on his personal property, because he wanted to understand its potential impact on the country he hoped to help run one day. A true visionary.

Those who know of Walt Disney must also be aware that he, too, loved personal train sets on which he was able to actually ride. All of the mass transit mechanisms, at both Disney World in Florida and Disneyland in California, could be said to be outgrowths of that love affair, from the actual set he sat ON to the many different he could sit WITHIN, from the steam locomotives to the Monorail.

Mine was never so ambitious. But it allowed me to see simple principles like the longer length of travel for an outer rail on a curve vs the inner rail, which is why an automobile must have a differential; to prevent wearing out tires prematurely and making handling really weird in any but wide sweeping turns. And the conversion of electrical energy to mechanical work, long before I was exposed to the theoretical constructs of physics which explained it in numerical terms.

Oddly, that also exposed me to graphic representation of the concept of resistance in a circuit, aka impedance, as anyone who has had a railroad set will recognize; the further the train gets from the point where the power source connects to the track, whether battery or transformer based, the slower the train goes. And it taught me to get creative in solving those problems, whether by reducing the impedance at the locomotive pickups, or multiple connecting points on the track layout.

I also had for a brief time a slot car setup, which duplicated many of those same issues. That was also when I noted another difference between the two types of toys; relative gearing ratios. It was rare, despite what I subsequently learned about their relatively higher propensity to tip over because of narrower wheelbase and taller center of gravity vs the slot cars, but the trains rarely got to enough speed because the motors ran at the same speed, probably because of the same voltages, but the trains were geared like the low gears of an automobile, wherein the engine turns a lot for relatively little turning of the actual drive wheels. Slot cars, on the other hand, were geared more like the upper gears of a car, so they would fly off the tracks despite their relatively better stability, merely because of the speeds they could reach.

That also taught me about the concept of torque, because the train locomotive could pull a LOT more weight than the slot car could hope to move. For all intents and purposes, the relationship is precisely the inverse. And, over time, I also learned the impact of dirt and the collection of carpet fibers around axles and in gearboxes, and that oil was never as good a fix as cleaning out the crap. I doubt I was remotely the first engineering student, therefore, to chuckle when my professors at Clarkson always said "assume there is no friction", because they wanted us to give them theoretical results which could be predicted, whereas real-world would NEVER quite work out that way ;-)

Because my O gauge tracks had the third rail, I knew they were not a real representation of the two rails I could see on every section of real-world train track. But that did not matter. And I DO know that lots of trains operate on electric power provided remotely from the train, even while diesel locomotives operate as diesel-electrics, actually controlled in much the same way. I quickly came to recognize that the models power supply was DC, and that operating the train in reverse meant reversing the connection on the rails. I had half expected the train would run backwards if I turned the locomotive around on the tracks, but was surprised when it didn't on the three rail tracks. That's how I learned about polarity, which uses the center rail vs the two outers.

It was only later that it dawned on me about AC, which I understood was rapidly switching that polarity back and forth, and that polarity ultimately HAD to exist even with AC in order to do any work. So why didn't a fan run backwards? And that made me want to understand how an AC motor worked vs a DC motor, something I later learned was one of the most powerful inventions by Nicola Tesla, who first conceived of AC to solve the "distance from source" problems which existed with Thomas Edison's DC power, and is why most of the electric grids in the world today are AC based.

And that last paragraph should be a most telling example of my not merely wanting to know the "what", but the "why" of which I wrote earlier. I think it is a common thread among engineers, just as I believe it has been that all of them at some point owned a model train set. Whether it will remain that way is hard to predict. Just as I noted for my Grandpa's ability to harness and control a team of horses, vs my ability if I am lucky to actually IDENTIFY one, we each have the "tech" from our own era. I am pretty capable around computers, which he would not have been, without some instruction. And my Granddaughter will be fully versed in the information age technologies like networking, but that much more removed from the concept of "horse" power than even I.

I enjoy watching her intensity when she is curious about something. Which is why I will never wonder WHETHER she will learn, even as WHAT she will learn is as unpredictable by me as the weather. But I hope she always wants to know WHY just as much as I ever did. Then I'll go get her a train set ;-)

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