Science Education vs Learning Science: An Anecdote about Losing Things

When I was about five years old, I got a gift: a set of shiny, illustrated, hard-covered encyclopedias. The books were small, and there was one for each major area of science (my favourite was the one about prehistory and dinosaurs). I adored them and pretty much knew them by heart - I can only imagine how grating it must have been on the nerves of every adult around me to hear about how the earth formed for the fourth or fifth time that day. Five-year-old me was convinced she'd be a scientist, a paleontologist perhaps, or a physicist and astronomer. I kept begging for more and more encyclopedias, and once we got cable TV (a bit of a novelty behind the newly lifted Iron Curtain), I was watching the Discovery channel so much that my grandmother got worried I would "go blind from all this television."

I tell this story for a reason - this was, in a way, the beginning of my science education. Like most children, I was in awe of all there was to discover and know. Today as an adult, I wish I could have kept that sense of wonder; I did end up studying science, even if not paleontology - but throughout the rest of the education process, play slowly transformed into work, and work transformed into chore, until math problems weren't puzzles to solve but something I would rather Google the answer to. I think that in part, this is due to where I came from. There's this one old TED talk by Steve Keil (who is apparently an entrepreneur - his talk is the only reason I know him) about Bulgaria specifically; it's called "A Play Manifesto" and can still be found on YouTube at the time of writing. It's all about seriousness and play, and the odd idea that if you're having fun, you aren't really working, if something is pleasant, it isn't good for you; if children are smiling, they are not learning. This is a really pervasive line of thinking in my country, especially in the school system, and it is generally how one gets from devouring encyclopedias to crying over a chemistry textbook. Naturally, as Mr Keil points out in his talk, this sort of "teaching" and "learning" is massively ineffective. Students memorize formulas for the exact duration of a science exam, and then forget everything they ever knew about Newton's laws, or how their own bodies function, or how to do differentiation. This educational practice has no clear overarching structure (despite being suffocatingly rigid), and it is definitely not driven by discovery. Of course, this phenomenon is not endemic to only my culture. The death of enthusiasm at school is relatable to almost everybody I have ever met who went through formal education.

Undoubtedly, as a child and teenager, it would've been hard to put this into words as I didn't yet have the right ones at my disposal. I'd go as far as to argue that advocacy, especially self-advocacy, is never as hard as it is when you're a child - automatically dismissed and disbelieved, and lacking the tools and even the vocabulary to express what it is that you (desperately) need. As an adult, and after having encountered Foucault's arguments on schools and prisons, it's much easier to talk about the limiting nature of formal education, especially science education, and the systems of power that children are thrown into, usually as early as possible. It's much easier to point to the

flaws in practices like grading, trying to teach using negative reinforcement, or the psychological impact of being controlled, micromanaged and surveilled, even when it is nominally for the purpose of helping you acquire knowledge and learn to function in society. It's possible to have an in-depth discussion on learning disabilities and learning styles, on self-learning, on teaching children through play, on the importance of science education and of scientific discovery and advancement. Nonetheless, I've noticed that it's still not as easy to return to the sense of wonder I had when I read my tiny hard-covered encyclopedias; not as realistic to be able to find the energy and presence of mind to process the much bigger wealth of scientific knowledge that I have access to now. I suppose what I am getting at is this: most of my formal science education damaged my eagerness and even capability for science, and it strikes me that good scientists who could drive humanity's progress are probably not made that way. I don't know what happened to the encyclopedias; maybe my mom gave them away.