

Letter to a Young Scientist

"Embrace the Detour"

By EMILY E. WIERINGA, PE

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DURING YOUR RIDE THROUGH LIFE THERE will be many roads leading to your dreams. Some will be straight and fast. Some will be steep, bumpy, and long. Without a doubt, there will be detours taking you on entirely new routes. Routes you never expected. No matter the distance of your journey, take it all in and pay attention to your personal detours. They can make all the difference in your life.

Main Street USA

Growing up I loved science, solving problems, and finding answers. Fortunately, my parents valued and fostered learning. I was exposed to a plethora of hands-on science activities, which truly inspired me. Seventh grade science fair was a curriculum requirement. This mandatory route introduced me to the world of hypotheses, experimentation, and the entire scientific process. I was hooked—wanting more and more science. Eighth grade brought my first science mentor into the landscape. Mr. Spencer Reames taught at a neighboring county high school. Passionately dedicated to teaching hands-on science, he held labs in the evening so his high school students could work on their science fair projects. He kindly allowed me to join his students and tackle sophisticated science projects throughout my high school career. My mentor opened the door to work in labs at The Ohio State University, exposing me to

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a level of molecular biology and genetics far advanced for a typical high school science curriculum. State and International science fair platforms offered me a glimpse into the magnitude of “what if?”

United Flight 2170

In the summer prior to my high school senior year, my journey landed me in Costa Rica in a college course on sustainable development. Rain forests, canopies, and indigenous plants deepened my interest in science and environmental conservation. This overseas study opened the eyes for a young, small-town, gal. The world coaxed me into learning even more.

In terms of learning, science fair work can be quite challenging. Just when you think you have an answer, something goes wrong or the conclusion throws you for a loop. As a teenager, the concept of time is not fully developed. My patience would grow thin when I hit bumps in the road, but I continued to try—and try again—searching for that elusive conclusion. My search for p53, a tumor suppressor gene in alfalfa and potato plants, never came to fruition. I never made an impact in that molecular genetics world, but still kept moving on.

Indiana State Route 26

Time to travel west to Purdue University with the thought of molecular biology as a career. I took for granted that my solid high school background would prepare me for chemistry weed-out courses. I was mistaken. The freshman college experience did not parallel my former detailed, hands-on, lab work. Roadblock ahead.

Detour No. 1: time to assess my strengths and true passion. Although I loved science, the actual application of science was more intriguing to me than pure research. For example, how to create



something to better others and our world. Solution: switch to the college of engineering. (Sidebar: my great grandfather, grandfather, and father, as well as many other relatives, are engineers. Ironic how genetics led me into the field of engineering.)

Engineering did not come easy. It required a lot of study to maneuver through the theory and rigor, but I knew helping others through problem solving was in my destiny. Sitting behind a computer and calculating is not my niche. I enjoy people and communicating with teammates as we work toward a common goal or project. To be competent, however, one must learn all aspects of a respective field. College provided the theory behind engineering principles but not the actual hands-on of how things are built. Tracing my biological roots led to the construction road. Moving on.

Ohio State Route 33

Summers found me interning for construction companies, and I eventually ended up in the field working as a jobsite superintendent following college graduation. I was no stranger to construction as my family operated a construction company. Steep incline ahead.

Detour No. 2: women are not represented on construction sites. Yes, I was the only female in the field. For the first time in my life I felt so small and alone. It would have been easier to quit and move to a safe position behind the computer. I stuck it out taking the steep, winding, slow journey, aware that it takes time to gain respect from male counterparts. Determined to work harder and smarter than my fellow workers, I learned a lot and accrued much knowledge in the construction field.

Trust me, I wanted this portion of my life to speed by, but five years of experience will always take five years. At times the real world is dreadfully painful, but you should always continue to learn from each of your detours and never give up on your passion. Paying my dues in a male dominated field allowed me to respect each person's role in construction and helped me to learn the logistics of a construction project with all its intricate pieces. Each day holds mini detours on a jobsite. New variables pop into the picture creating a vast puzzle. With perseverance, bit-by-bit, the pieces eventually fall into place.

Hard work and going "above and beyond" in any activity will eventually pay off, no matter what field

you choose. Believe me, those work ethics do not go unnoticed. Hard work is precisely what enabled me to move up the career ladder quickly and into project management.

At this point in my journey, I am speeding through the construction environment. Working with diverse groups of colleagues, we collaborated, implemented, and breathed 3D life into designs. The excitement of watching the end user walk into a newly constructed building or complex is what motivates me. I love the art of pulling a project together, accomplishing a goal, moving on to the next challenging project, and doing it all over again. Speed limit sign posted on a curve in the road. Slow down.

County Roads

Detour No. 3: balancing family with a time-consuming, stressful job. Children add a whole new, wondrous, dimension to life. They bring color and joy to your world. And along with the responsibilities of parenting come the nearly impossible decisions on how to blend career and family.

For a few years, I stepped back from the 70-hour construction work weeks. Up to this point in my life, success was always measured in tangible metrics: moving up the professional ladder and gaining more responsibility. That became easy in the professional world. What I struggled with now were the intangible metrics and the balance between personal and professional. When an opportunity presented itself to work at a county engineering office, I took a hard detour, left the rigor of private vertical construction, and dove into the new field of public infrastructure. This opportunity allowed me to understand the administration of public funds, apply for and oversee several grants, and work with a multitude of other government agencies—which I loved. It also gave me the time to study and pass my professional engineering licensure test. Although my experience at the county was fruitful, my true passion was in vertical construction and the next detour led me back.

Powell Road

Detour No. 4: actually, this detour was a reroute. Early in my project management years, I had the opportunity to serve as the general contractor's project manager on several Columbus Zoo and Aquarium exhibits. What a perfect opportunity to blend science and engineering as I learned about the different

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animal species. Our task was to create habitats which provided the safest, and most natural, environments for the animals—plus bring an immersive experience to the Zoo's guests. We built biogeographic regions to transport a guest's senses to the same regions as the animal species. It was like creating a piece of art. This reroute to Powell Road led me to many other zoo projects and the ability to specialize in zoological construction.

The professional reroute to zoo projects, as a contractor, ended up placing me in my current position as Director of Construction and Engineering for the Columbus Zoo and Aquarium. I would never have imagined working at a zoo back in high school. It has been a wonderful experience interacting with so many amazing people who are also passionate about science. Their devotion to saving animal species through conservation projects inspires me. My responsibility is to implement the visions of these devoted individuals by transforming our Zoo into specific geographical regions, allowing our guests to connect with wildlife. From design to construction and then to operation and maintenance, I get to witness the total experience.

Our Zoo not only works on conservation projects locally, but internationally as well. We support many programs abroad, and recently I have been able to assist with one of them. The Dian Fossey Gorilla Fund International (DFGFI) received funding from The Ellen DeGeneres Wildlife Fund to build a new campus for DFGFI's organization in Rwanda. The Columbus Zoo President and CEO is on the board of the DFGFI, and asked if I would help by participating on the facilities committee that will oversee the construction of this new campus. The work DFGFI does is amazing! This year I was given the opportunity to go to Rwanda and see where this campus will be constructed. I have fallen in love with the country, its people, and the gorillas. There will be more to this overseas journey in the future, but it has been an amazing experience so far and I cannot wait to see this project through to completion.

Sure, there are highs and lows as there are in any career, but there is never a dull day at the Zoo. The things that both guests and animals do will never cease to amaze me. The amount of effort and creativity

required to design and plan for what you think the animal will (or will not) do is about the same as planning for the human antics as well.

Some days you head for home deflated and beat down by the negative, but how you overcome the disappointments is what people will remember. You will make mistakes, but owning up to them, learning from them, then moving on will make you better and stronger in so many ways.

The Road Never Ends

My advice to young scientists is to be a life-long learner. At age 42, I still learn something new every day. I am grateful for those opportunities. It is easy to measure a professional career by job titles and salaries, but those who balance careers and personal well-being are the true superheroes. I encourage you to seek outlets that provide time to reflect. Running and travel are my go-to activities.

A clear perspective is essential for driving down future roads. Serendipitously, I just uncovered this piece of advice from Netflix® co-founder Marc Randolph (Elkins 2019). Randolph shared the rules of success his father gave him.

- Do at least 10% more than you are asked.
- Never, ever, to anybody present as fact opinions on things you don't know. Takes great care and discipline.
- Be courteous and considerate always—up and down.
- Don't knock, don't complain—stick to constructive, serious criticism.
- Don't be afraid to make decisions when you have the facts on which to make them.
- Quantify where possible.
- Be open-minded but skeptical.
- Be prompt.

These points resonate with me as well.

I am still traveling down my life road and not sure when the next detour will appear or where it will take me. I have learned, however, to embrace detours every step of the way. I hope you will too. Enjoy the journey!

Elkins K. 2019 Sep 30. Netflix co-founder Marc Randolph shares the 8 'rules for success' his dad gave him when he was 21. CNBC Make It. [accessed 2019 Nov 5]. <https://www.cnbc.com/2019/09/30/netflix-co-founder-marc-randolph-shares-his-rules-for-success.html>