

# Napkins and Naivety



Engineers Without Borders began far away from the dry savannah of Burkina Faso, the farming villages of Northern Ghana, the vast maize fields of Zambia, and the shores of Lake Malawi. At its very beginnings, EWB was nothing more than two young Canadian guys with the vague notion that engineers should do a better job of living up to their aspiration to serve society.

George Roter and Parker Mitchell, undergraduates at the University of Waterloo, had just completed their last student co-op terms: George had made printers print faster, and Parker had improved door hinges for the 1998 Saturn. Months away from graduation, the conventional path was laid out before them: go to work in an engineering firm, or in infrastructure, or in project management; maybe go back to school and get an MBA, or a medical degree, or a law degree; go back to business and become a manager, then climb on up the corporate ladder. George and Parker, like most engineers, had invested years of their lives getting

a highly respected degree, one of those degrees that parents like their kids to get so that they know their kids will be qualified, self-supporting professionals. Engineers.

But so far, focusing on engineering left them feeling that something was lacking. Their courses and co-ops hadn't left them inspired, and they wondered if their class projects - such as improving beer dispensing systems - were really about engineers serving society. In between their doubts, their classes, and the requisite all-night study sessions, George put in a stint on every sports team on campus, and Parker tried to get out of the engineering box by taking the occasional linguistics course. Along the way, they kept alive this desire to use engineering for social good.

When Parker started looking for a fourth year project, he wished he could tackle something that felt important and meaningful - something more significant than door hinges on cars. While looking through the notes of an old professor, originally from India, he found a scribbled note about the lack of clean water. Hundreds of millions of people in India, and more than a billion worldwide, didn't have access to clean water. "Now, that's an engineering problem I want to try to solve," Parker thought.

George, whose interests were moving towards biomedical engineering, started brainstorming with Parker. A few weeks into the project, they were zeroing in on a technical solution: solar-powered pasteurization, incorporating high UV absorptivity and low IR emissivity paint on mylar film tube. Combine it all with a reverse flow heat exchanger and a car radiator thermostat, and the water could be heated enough to kill pathogens. They had been reading about "appropriate technology", and knew that low cost, locally sourced materials were important in development. With the proposed solution coming in at less than \$15 per

device, they thought they had a success on their hands.

It took a lot of reading and prototyping before they realized that their Waterloo fourth-year project was not, in fact, going to solve the world's problem of lack of access to clean water. After a few months of research, they realized that designing a new technology in isolation in a research lab seldom made for a solution. Numerous low cost filters had been designed by well-intentioned Westerners, but failed to take into account simple implementation realities. For example, in the context of a small village, community members who had been drinking local water every day of their lives might not associate the water with sickness. If you hadn't been taught about clean water as a kid, would you believe it if someone you had never met told you to run your water through a solar-powered mylar-something whatchamacallit because invisible things were making you sick? As they talked with researchers already working in development, Parker and George learned that getting technical design right was not enough. Just as frequently, it was issues of local manufacture, distribution, and marketing that were the unsolved problems.

That first project didn't go beyond a prototype, but did give Parker and George a clue to what they were missing in engineering: here were the problems worth spending late nights on. They kept reading and researching. In the United Nations Human Development report, which ranks countries on the Human Development Index (HDI) – a measurement based on education, health care, income, life expectancy, and other quality of life indicators – they found statistics of disparity. While Canada regularly ranked #1 on the HDI, the worldwide picture was grim. Two billion people without access to electricity. An emerging “digital divide” between rich and poor countries. A global majority lacking access to the sanitation and health services that university students in Canada took for granted.

For George, who had grown up in a household where the door was always wide open for housing someone between jobs or between homes, a household acutely aware of the struggles of people living in poverty in Canada, the immensity of global poverty was morally intolerable. For Parker, who was frustrated with engineering assignments that focused on making printers faster or improving door hinges on cars, global poverty was intellectually reprehensible. With all the world's wealth, resources, technology, and education, how could such poverty still exist? As George and Parker thought more about what they were going to do after university, the conventional route held less and less attraction for them. They were concerned with the engineer's obligation to society, and their determination was growing: the Canadian engineering profession – students, professionals and companies – could – no, must – use its skillset to tackle social problems.

## **“Do you remember that idea we had? Engineers Without Borders?”**

When graduation came around, though, both George and Parker put their convictions on hold. It was time for them to enjoy their last summer before they entered the working world. George headed off to travel around Europe by bike, and Parker to cycle through Ecuador. After months on the road, they regrouped in Toronto. It was the end of the summer, and they had their future plans lined up: George was returning to Waterloo to start a Masters in biomedical engineering, and Parker was joining McKinsey and Company as a management consultant. They got together over a coffee in North York, at either a Timothy's or a Second Cup (they have argued ever since over which coffee shop it was). In suburban Toronto, surrounded by grey and concrete, far from the dirt roads of Ecuador or the mountains of Europe, they talked about what was coming next. The “successful” options stretched before them – a prestigious Masters, possibly a PhD; a well-paying consulting job which opened up opportunities to climb the corporate ladder.

There was a pause in the conversation as they thought about it: graduate student cubicles, offices, and consulting. Was this really the next chapter in their lives?

As the pause lengthened, Parker cleared his throat and said slowly, “Do you remember that idea we had in university? Engineers Without Borders?”

With his words, it all came flooding back to them: the frustration they'd had in engineering co-op jobs; the desire to do something significant with their engineering education; the statistics: one billion people living on less than \$1 a day, two billion people without access to water and sanitation. The idea that had kept them up late at night talking: the

dream of an organization that would enable engineers to contribute something other than another bridge or another electrical grid. In their excitement, George and Parker pulled the classic “brainstorm on a napkin” routine, jotting “Engineers Without Borders” in the centre and then scribbling down a business plan. “Create chapters.” “Send volunteers to work in third world countries.” “Raise a lot of money.” “Create an online research centre.”

With that, it was decided. George would start his Masters, and Parker would go to work at McKinsey, but they would both put all their spare time and energy into figuring out what they needed to know to get this organization started. As this was back in the days before Google, they relied on networks and directories to get the word out to as many people as possible. They found a listing of Canadian non-governmental organizations and wrote letters to 30, trying to convince them that Engineers Without Borders was a great idea. They asked half a dozen of their friends and colleagues to a visioning session around George’s parents’ dining room table. They called up everyone and anyone who they thought might have money to donate - Parker even called a friend from elementary school, someone he hadn’t seen in five years, because the friend’s father worked for a big company and had ties to South Africa. George called up his father’s company’s accountants and tried to negotiate free accounting services for EWB. Knowing they would need legal advice, they both went through their networks trying to find a lawyer. Eventually, Parker tracked down a man who, twenty years before, had hired Parker, then just a kid, to walk his dogs. Now a senior partner at a law firm, the man got a call from Parker, wondering if the dog-walking services might now be repaid with some pro bono legal advice.

In the winter of 2000, George went to the Canadian Engineering Competition with the explicit intention to advertise EWB and recruit

its first members. He didn't sleep at all the night before, designing and printing an EWB brochure and then building a display booth. The next morning, with the paint still wet on the display, he shook hands with as many people as he could, gave out as many brochures as he could, and said "Engineers Without Borders" as many times as was humanly possible. The word spread through universities around Canada - within a month, he and Parker were inundated with phone calls and emails. By 2001, over 1000 members had joined and a handful of chapters were starting. And just a year after that, EWB had grown to over 3000 members at 20 chapters.

George and Parker were in the right place at the right time: they had dared to ask the questions that, once asked, everyone wanted to help answer. Why couldn't engineers put their problem-solving skills to work by addressing some of the biggest challenges we faced at the turn of the millennium? Why wasn't there a role for us to play in making the world a better place? Why did extreme poverty exist, and what were we going to do about it? 💡