

# Wires

Jacob's eyebrows furled together as he held his thin arms in front of him. His eyes narrowed as he focused. His broken right hand dangled limply at his wrist, covered in glistening white electrode pads that extended up his forearm. Dozens of wires were neatly drawn from the electrodes and fastened into a ribbon cable that led to a dull, grey box beside him on the workstation.

A light asthmatic rattle accompanied Jacob's deep, slow breaths as he tried to clear his mind. Weeks of wiring and soldering and studying led to this moment. He willed himself to wiggle his fingers. The murmuring of the other students in the room slowly faded into a muffled silence as he focused. He imagined opening and closing both of his hands into fists in the open air and grimaced as a dull throbbing began to pulse through his right arm. A throbbing, accompanied by electrical pinpricks with each motion. Painful. But he could feel his hands moving together. Weakly. Awkwardly at first, but with increasingly deliberate motion, grasp after grasp.

He opened his eyes and marveled at the ease of it. Until today, the muscles in his right forearm were useless, unused for two years as a result of a construction injury. Now, through throbbing pulses, his hands moved in mirrored unison. Several classmates around Jacob cheered quietly for him from their own workstations. He was the first in the class to complete the *Biopathy* lab assignment; the first to problem-solve his own paralysis. None of the other students were even close.

An Instructor sat at the front of the room behind a polished metal desk. The transparent computer monitor flashed as notifications appeared on the screen. Laura Mirum squinted through the harsh green lettering and scrolled through the incoming messages, trying to interpret the new acronyms and codes. The Engineers added new projects almost daily, and she was still adjusting to her current role. She could hear a murmur in the classroom and adjusted her focus through the Glass screen, still rubbing her temples. One of the students stood at his workstation. Welcoming the distraction, she leaned around the screen to get a better view. *Oh, finally*, she spoke under her breath. Three weeks without any progress to report made for a rather boring time in the classroom. She stood up and walked towards Jacob, carrying a handheld Glass tablet. She typed on the screen as she walked.

"Instructor 6-4-5, recording of student 1-0-7-5-4 for Biopathy Project." Laura held the tablet in front of her as she recorded the movement of Jacob's arm. "Wiggle your fingers, Jacob." He complied without looking up. "Motor function appears to be correct," she said with an edge of excitement in her voice. She stepped towards the grey box on Jacob's desk as she continued to record, placing her hand on the numeric keypad on top of it. As she keyed in a series of numbers, the Glass tablet lit up and began receiving data.

"Congratulations, Jacob!" She glanced down at the tools on his desk. The soldering iron sat upright, docked next to the tightly wound coil of solder. Wire cutters were tucked in their plastic sleeve and sat exactly perpendicular to the soldering iron. "It looks like all that extra prep work with the wires paid off. How do you feel?"

"It works," he replied without looking up at her. He ran his right hand across the desk, articulating his fingers over the tools. Jacob slowly made a fist and tightened his grip, fighting to hide the pain that coursed through his hand from the electrodes.

Laura studied Jacob's face through the Glass tablet. His jaw muscles flexed slightly as he clenched his teeth together. She shifted her focus to the words on the screen. *Student's emotional response to success (1-10)*. The on-screen prompt blinked rapidly, waiting for an answer.

"On a scale of one to ten, Jacob, how would you say you feel about your success?"

He relaxed his grip and dropped his shoulders. "I feel great," he said flatly as he adjusted a dial on the control box.

"So... would you say... an 8, then?" She waited, and then keyed in the response anyway when he didn't reply. "Ok. Anything else you'd like to report to the Engineers?" She continued to watch Jacob as he adjusted the dial. No reply. She sighed and lowered the Glass tablet as she walked back to her desk, glancing back at Jacob. He didn't look up. Apart from very short answers, Jacob didn't engage much with her. He was a very odd student, but at least he completed the assignment. The Engineers would be pleased at the success of their program.

Biopathy wasn't new technology. There were medical facilities in the city that handled conventional medical emergencies and bodily repairs. But most of the city infrastructure, including education and medicine, was designed and maintained by the Engineers. They believed that self-directed medicine would benefit the overall health of the population, allowing citizens to perform minor triage and surgeries on themselves. With the addition of the Biopathy program, students could learn to manipulate and correct the underlying electrical structure of their own bodies. The Engineers would provide the education material and equipment.

Jacob was annoyed by the aching sensation that accompanied his movements. The dull pain spread through from his palm to the tips of his fingers. It peaked in his wrist and radiated up towards his forearm. The Biopathy instruction guide mentioned a tingling, describing it like the pins and needles one feels in their feet from the loss of circulation. This was not *tingling*. This was a deep throbbing, increasing and decreasing in waves that accompanied every motion of his fingers and hand. Jacob reached over to the control box and turned the primary dial down, and immediately the throbbing decreased. His hand's responsiveness to his thoughts also decreased. "No pain, no gain," he muttered to himself as he turned the dial up again.

The technology was simple. The metal collar hanging from Jacob's neck recorded electrical impulses from his brain and transferred them wirelessly into the school's Biopathy hardware. There, the impulses related to motor-control were isolated and amplified. A wire ribbon cable ran between the machine and the electrodes on his forearm, allowing Jacob to

move his paralyzed hand by simply thinking about it. The machine, humming on the desk, was stamped, "Property of Seattle."

"Hey Jacob, nice work man." Marcos, whose arm was half buried in a tangle of wires and loose electrodes, called out from the adjacent desk. He leaned forward and a mass of the wires shifted off the desk and onto the floor. He winced, and shrugged his massive shoulders.

"Thanks. Hurts, though. It's not supposed to hurt."

"Pretty sure it is. It's hurting me, and I don't have it working yet!" Marcos laughed. He raised his still-limp hand and shook his arm; his fingers and cluster of wires flopped back and forth. More wires fell to the floor. His paralysis included severe nerve damage in several fingers. They appeared to be reattached after some injury that he still refused to discuss, even after prodding from his classmates. Whatever the cause, the patchwork of electrodes spanned his entire hand, and between each injured finger. "How do you keep your wires so... organized?" he laughed again, trying to untangle the wires.

Jacob shook his head. Marcos' workstation was chaos. Loose wires draped across the desk and wire clippings littered the white glossy floor around him. Jacob wondered to himself how anyone could work like that. Nothing in place. Wires everywhere. Many of the other students had their own messes - various states of disarray. But none were like Marcos'.

"Are you gonna help me, now that you're done?" Marcos batted his eyes.

"There's no helping you, Marcos. Not until you clean up your mess." He kept adjusting the dial on the Biopathy machine, hoping to find the perfect signal level. He tried to avoid looking at Marcos' workspace. It made his eye twitch, just thinking about it.

"Maybe I'll just ask the Instructor to help again. She's hot, right?" His eyes narrowed, studying Jacob's face for a reaction.

"She's useless. The Instructors don't help. You know that."

"Mm hm," Marcos said, wryly. Jacob refused to respond to personal questions. Trying to get under his skin or get a reaction out of him became a personal challenge for Marcos. "Super hot." He waited, watching. Still no reaction. "Hey Jacob," he called out again.

Jacob was busy soldering another set of wires. "Yeah?" he responded, after a few seconds of silence.

"These control boxes are, what, 20 kilos?"

"Twenty *three*," Jacob countered. He unwrapped a sterile electrode pad and placed it on his desk.

"So how do *you* plan to lug this thing around?" Marcos patted the machine on his desk. "I can carry 23 kilos, no problem. But you're not a big guy. How are you going to carry it?" He chuckled to himself.

"I don't know. You're strong. Maybe I'll make you carry mine, too." The left corner of his lip rose slightly. He glanced at Marcos, who still had his good hand on the biopathy machine.

Neither the manual nor the Instructor provided information about post-education. Now that Jacob successfully solved his paralysis, he wondered what the Engineers had in mind. They

rarely provided outlines that explained their processes. They just solved problems and gave directives. Jacob would just have to wait and tinker on his own. He glanced at some of the other students in the class. None of them were far enough along nor forward thinking enough to think about next steps. With the exception of Marcos. Despite his apparent lack of progress, Marcos seemed particularly *aware*. This was an unusual trait for people their age. Most students accepted assignments from Instructors without much question, and transitioned from students into some other role in society. The Engineers built the education system to simultaneously instill conformity and empowerment, which lead to highly skilled adults, although there was a conspicuous lack of ambition among the city inhabitants.

Jacob wondered how far Marcos' ambition would take him. As Marcos lifted the heap of wires from the floor, his elbow bumped his Biopathy machine, nearly causing it to fall off the other side of the workstation.