

## The Study Session

---

Her house was like a brain, Ashley thought. In the brain, whenever a person accessed memories, the neurons associated with those memories lit up with electrical activity. In her house, some rooms hadn't been lit in months. It was like they no longer existed, like no one ever thought of them anymore. When she walked by, she didn't even look at them. She knew exactly what they looked like, and they hadn't changed. In her analogy, her house might have been suffering from amnesia.

Her father snapped his fingers.

"Focus, Ashley."

Ashley shook her head irritably and returned to the work in front of her. There was a whole stack of dusty encyclopedias she had never used and probably never would, but her father was an old-fashioned sort of man who didn't completely trust the internet—at least, not enough to aid in his daughter's studies. Two notebooks sat to her right: one for the rough draft of her homework, and one for the clean final copy. To her left was a worn notepad with pi written over and over in tiny numbers on

the front and back of every page. A biological psychology textbook was propped open in the center of the table, displaying the different areas of the brain and their functions. There were also pages upon pages of calculations, formulas, and words most people likely never said, much less tried to spell.

“Is everything all right, Ashley? You look distracted.”

Ashley glanced up at her father. She didn’t have enough energy to raise an eyebrow at him. That usually served to antagonize him, but she was too exhausted to play games.

“I don’t know about distracted, but the fact that all my available stamina is currently going toward keeping my eyes open is certainly not helping me retain information.”

“You can go to sleep soon. I’d just like you to finish this chapter’s exercises.”

“I’ll get one hundred percent on this exam and you know it. Please let me sleep.”

“I’d like to see it. Finish the exercise.”

Ashley sighed and look back at the book, making her eyes move left and right so her father would think she was reading. She had already memorized every word on every page in this chapter, so there was no point expending any additional effort. Her eidetic memory was an invaluable asset to her studies, but her father being old fashioned like he was, he wanted her to study *his* way. Review, review, review. Practice, practice, practice. But repetition was irrelevant; Ashley had memorized pi past seventy digits on her first attempt. While her father understood her intelligence, he didn’t understand that her learning style was different than what he was used to. And he was a teacher, go figure. Her heart momentarily went out to his current students. Poor things.

“You’re doing it again. Don’t think I don’t notice where your eyes are actually focused,” her father said sharply.

Ashley turned her piercing blue eyes on him. Her intense stare could make most others back down, but her father was, unfortunately, immune to that.

“Apologies. I’m just amused at the irony of this situation.”

“What irony is that?”

“You push repetition so hard as a method for learning, but no matter how many times I repeat that this will not work for me, you still insist I continue. Perhaps irony isn’t the right word; I think what I’m looking for is... *inconsistency*.”

Her father sighed and pinched the bridge of his nose.

“I understand this is frustrating. I’m just trying to make sure you understand every concept. This coursework is beyond what I ever studied, so I don’t know how best to teach you. But not every student can say they got accepted to a very competitive university when they were nine.”

“I wish, then, that you would trust that I know what works best for me. You can’t laud your nine-year-old daughter for doing harder work than you ever have and then insinuate you know what’s better for her academically.”

Ashley rubbed her eyes. It was only eight in the evening, but she had been studying all day, mostly at her father’s behest. She was graduating high school later this year, but she had been given permission from an esteemed local university to take a course there as a sort of trial run. If she did well enough, she would likely be granted admission the following year. The exam was next week, so it was crunch time. Her father was eager and excited for this opportunity—more than she was, in fact. It was hard for her to feel excited about anything these days. She had suggested the possibility of depression to her father, but he had disregarded it. People her age couldn’t get depressed, he claimed. A child’s brain wasn’t developed enough for that. He told anyone who would listen how smart his daughter was, but

whenever it came to her needs, she was still just a child. How convenient.

“Okay, how about we do this,” her father started, his voice softer. “Answer the first three questions and I’ll let you head to bed. Does that sound all right?”

“No, but it sounds like an improvement, so if I’ve absolutely no alternative, logic dictates I accept.”

“What if we make the questions about dreams?”

Despite herself, Ashley perked up at the question, and her father smiled. She couldn’t help it. Dreams were her favorite area of study.

“I thought you might appreciate that. Now, question one: name the stages of sleep and what happens during each.”

Ashley finally managed to raise her eyebrow.

“Really? We’re going easy mode, too?” Her father simply smiled encouragingly. “Fine. Far be it from me to complain of an advantage. There are four stages of deep sleep, as well as one stage of paradoxical sleep. During deep sleep, cerebrospinal fluids cleanse neurotoxins, like beta-amyloid, from your brain to prevent a buildup of proteins that can cause memory loss or dementia. Paradoxical sleep is when memories are strengthened via the reverberating circuit and when useless synapses are discarded.”

“Excellent. Question two: where are memories stored? The hypothalamus, the amygdala, or the prefrontal cortex?”

“Trick question,” Ashley answered instantly. “Memories aren’t stored anywhere; the neuron clusters that contain the *information* from your memories are all over the synaptic network, and everything is interconnected. That contributes to why, when you remember one thing, you might think of something else, then something else, and so on.”

“Good, good! Now, here’s a fun one for the last question...”

Ashley groaned. *Fun* usually meant her father's attempts at being challenging.

"No, this will be enjoyable, I promise. Let's say I have a woman at work who is big into dream interpretation. She thinks that dreams are messages from our subconscious, that our brains are trying to tell us something. What would you say in response?"

Ashley's eyelid twitched.

"You do enjoy tormenting me, don't you?" she said, then took a deep breath as her father chuckled. She pushed the notebooks away from her and clasped her hands neatly on the table in front of her. "First, I would tell her that she is unequivocally incorrect in every way. Second, it's *unconscious*, not *subconscious*. Actual scientists would cringe at that verbiage. Third, dreams are meaningless. There's nothing to interpret. We're not psychic creatures, so that's a lot of nonscientific woo designed to make people feel special because most people assign supernatural meaning to things they don't understand."

"But why are dreams meaningless? They certainly have a profound emotional impact on people. They also contain information from our everyday lives, which is uncanny, no?"

Ashley stood up and started to pace back and forth. The pencil she had been writing with rolled slowly across the table and fell to the floor, but Ashley took no notice.

"No. Dreams occur because our brains are active while we're sleeping. Our brain doesn't just *shut off*, there's activity there; neurons are firing off all over the place, so our brain is essentially processing memories while we're asleep. That's why what we see in our dreams is often somehow familiar to us. The only difference is that the prefrontal cortex isn't active, so there's no filter for all that information, which is why our dreams are so bizarre. Our brains are processing an immense amount of infor-

mation from all over the synaptic network with absolutely nothing to make sense of any of it. Dreams are basically hallucinations.”

“But hallucinations happen because we’ve been awake for too long, yes? How can that be the same as something that happens when we’re asleep?”

“Because when you’re deprived of sleep for too long, there’s a decrease in blood flow to the prefrontal cortex, so once again the filter becomes ineffective. That’s all dreams are, there is *nothing* special about them whatsoever, save for the single exception you and I are both privy to,” Ashley said heatedly.

“Fair enough!” her father surrendered, raising his hands with a smile. “But while we’re on the subject, this woman told me about something her son is doing. It’s called the Uberman sleep schedule. Have you heard of it?”

Ashley’s eyelid twitched again in response.

“I thought you might have. She thinks it’s a wonderful idea and wants to try it herself to increase productivity. I actually thought I might try the same. Apparently you can get by with only an hour of sleep a night without any adverse effects. She says it works by forcing your mind straight into REM sleep rather than going through the useless other stages. What do you think?”

Ashley thought she might scream.

“Dad, *please*. I cannot suggest you do that because I am not an advocate for self-harm. The other stages of sleep are hardly useless! If you don’t proceed through slow-wave sleep, those neurotoxins will build up and cause serious damage. Every stage of sleep has a purpose.”

“She claims you won’t be tired at all once you get used to it.”

“That may be true, because it takes advantage of your body’s

circadian rhythms, but if you miss even *one* segment of sleep, you need to start all over,” Ashley seethed. “It is incredibly unhealthy. I would say she is more than welcome to attempt it if she wants to develop Alzheimer’s, but it sounds like she’s already got many things wrong up in the empty pocket where her brain should be.”

There was silence for a few moments, and as Ashley looked at her father over the giant stack of encyclopedias, she noticed he was still smiling.

“I’m well aware these last questions were not from the books, but where did they come from? Do you enjoy riling me up?” she continued.

Her father stood up and walked over to her, then gave her a tight hug.

“I enjoy seeing you get passionate about the things you love. I’ve noticed you seem apathetic about many things recently, so it’s nice to see you still have that fire.”

Ashley said nothing. Her father knew how to get under her skin, but he was right. Getting up every day took just about all the energy she had, and she went through the rest of her day in a monotonous, grey world where nothing was interesting and everything took effort. But, exhausted as she was, as purposefully frustrating as her father was... she felt better. She felt *anything*, and that was a blessing.

Here in his embrace, surrounded by the school supplies he had so helpfully laid out for her, in the only room in the house that currently had a light on, she felt a little guilty. Maybe he was more aware than she gave him credit for. Maybe he deserved at least a little credit for trying to do what was best for her.

“I love you, you know that?” her father said as he let her go. “I know I push you hard, but I don’t want to see you lose your-

self in all this. At least I know how to make you feel better, right?”

Ashley raised an eyebrow again, her fierce blue eyes locked with his calm brown ones.

“Ice cream also makes me feel better.”

“In that case, get your shoes on while I get my keys. And while we’re on the way, you can tell me a little more about this sleep cycle.”

“That woman at work you talked about is real, isn’t she?” Ashley asked, rushing to the front door to grab her shoes.

“She is indeed. I suspected she was off her rocker, but I didn’t know enough to tell her where she was wrong.”

“Did you say anything?” Ashley said impatiently. It was fall, which meant their pumpkin ice cream was in stock again. She didn’t want to miss that.

“I just said I knew someone who was an expert on the subject and that I’d get back to her,” her father winked. “Let’s get going. You deserve this for acing your exam.”

“I haven’t taken the exam yet,” Ashley replied, confused. Her father smiled.

“True, but you’ll get one hundred percent, and I know it.”