Chebyshev's Sigma

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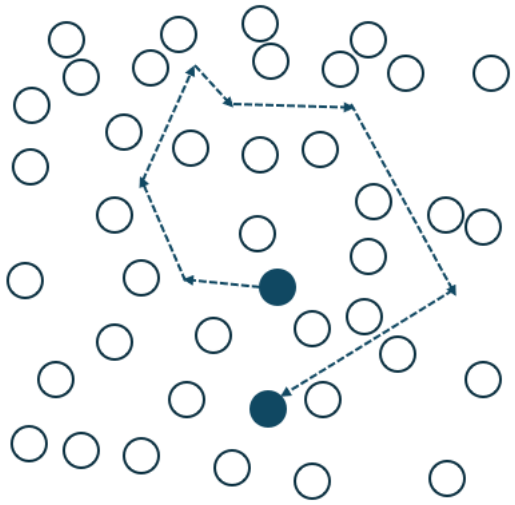

CHAPTER 1

"Synsync launched 20 years ago today, and Multiview Corporation is tremendously proud of the lives that have been saved from this remarkable therapy. Many believed that biological disease and decay were inevitable parts of the human experience. But we changed that. Synsync has optimized the human condition, no patient using Synsync has reported as much as high cholesterol, and we've virtually eliminated cancer, a disease that has ailed our species for generations-" The audience cheered loudly as Dr. Wyatt paused. "-but optimization of the brain has for too long eluded our grasp." Dr. Wyatt spoke as her platform levitated toward the center of the audience, and the crystal lights on the chandeliers rearranged to form a 3-dimensional model resembling an active human brain, immersing the room.

The audience of students and media at the university oratory center smiled in amazement and anticipation. While the crystal magnets were not an entirely uncommon rendering medium for a lecture, it was unusual to see one with this size.

"We often believed that the brain would never truly be solvable. But Multiview is here to tell you that it is solvable, and we have solved it." A large grin crossed Dr. Wyatt's face. "Neurosync is a game changer for humankind; it will optimize intelligence and correct disorders and other neurological inefficiencies."

The lights began to dim as Dr. Wyatt concluded.

"I never would have dreamed I would be part of something that could change human performance like this. Trial participants have already reported marked improvements in significant brain inefficiencies like IAD."

Zara Coper felt the familiar sinking feeling that she had always experienced whenever irregular adaptiveness disorder was mentioned.

"We've come a long way toward treating individuals with less-than-ideal intellect with respect, but they can't be in positions of responsibility. This product can correct their intellectual profiles so that they can eventually be equivalent citizens."

As Zara began to rise in anticipation of the doctor's introduction, her shadow arose with her. She was disturbed by the shape of it, as the casting of many illumination points in the room had muddled together. She could tell that parts of her figure were in the shadow, but they often lacked clarity, and they were mixed with other figures she did not recognize. The shadow remained visible while she was speaking despite her attempt to ignore it.

"I'm pleased to be with my amazing team responsible for this spectacular achievement. Our engineers, and of course, our lead oracle Ms. Coper, who I'm sure you all know."

Excited whispers spread in the audience. Nearly all the students wanted to become an oracle themselves one day, but they knew that passing the neuro-intelligence scan selection would be nearly impossible. Oracles were one of the rarest (albeit most important) positions in the universe, and to become one, a person would need extremely high intelligence magnitude in risk assessment, decision making, and skepticism (although high intelligence in fictional story telling was not required).

“Thank you, doctor.” Zara said with a warm smile and wave. “Now I know you all have questions about how this works, but it’s more elementary than you might think. It works very much like Synsync, except the medium is the brain rather than something like a cardiovascular system. Recall way back when you were little and learned about computing machines; they are just a way for us to use an input to create a desired output. In this case, the desired output is efficient intelligence, and the input is the neurons in the human brain. We map all the activity from the neurons in the brain into a matrix of variables representing activity level of the neurons and associate different combinations of neuron activity with performance outcomes. For example, I know none of you have been in this situation before, but let’s say for argument purposes you are running late to a class…” The audience chuckled as the crystals realigned to show two people running, with one moving more quickly across the auditorium than the other. “The brain tells your body how to move. Some people can run faster than others because their muscle-skeletal structure is more efficient, but the larger reason is the very specific and unique neural activity that controls muscle response and contraction. After studying the best runners in the universe, we know exactly what the neural activity should look like when the body is performing at peak levels, and Neurosync simply corrects the brain so that it will respond this way when running at high speeds is desirable. The same principle applies to more significant intellectual inefficiencies. Much like the human body, the ideal intellect is one that lacks errors and divergences from composite averages, where we know the composite average of humans tends to have the best survival performance.”

“Of course, there was a massive data collection and organization effort to identify the right neural activity, but I’ll spare you the detail.” Zara again smiled confidently. The auditorium lighting returned to normal.

“What questions can we answer?”

As usual the audience was shy, and it took a few moments for the first hand to show.

“Ms. Coper, I’m so excited to see you in person and I always wanted to be an oracle. We’ve learned a lot about Chebyshev’s sigma. Do you think we will ever be able to eliminate it?”

“Good question. This is a very advanced topic.

Humans have come a long way in controlling the space and time of our universe, but our understanding of the fifth dimension, Chebyshev’s sigma or ‘environmental volatility’, is quite far behind.

We at least now have tools to estimate what Chebyshev’s sigma is in a particular environment, and we even use the same tools when completing scientific reports to verify that any result deviations are driven only by sigma rather than an alternative hypothesis.

To be fully transparent though, it's still a philosophical debate whether we will ever be able to master it. We know that the end of the earth's Mesozoic era, the Great Wormhole, and even the beginning of the universe were likely born in environments with high levels of Chebyshev's sigma.

So where would we be now if there was no sigma, would we even exist, and is it even something we were meant to ever control? I don't know. We try to prepare for what the unknown will be, but "Father Sigma" as I call it will always be our lord of unknown unknowns."

The audience sat in awe of Zara's deep enthusiasm for the topic.

The audience proceeded to ask the typical questions with which Zara was familiar, and Zara especially enjoyed showing her competency by offering the responses.

It eventually became time for the last question. Zara noticed the student's timid face as the student's platform entered the center.

"I'm not sure I understand the science." Zara could feel the collective shock from the audience. It was unusual to see students admit their own intellectual inefficiency, particularly during a lecture that was all about eliminating it.

"Isn't a part of a human's performance driven by their own agency and personality? How would Neurosync affect the subject's agency and personality? What about imagination?"

The audience giggled as Dr. Wyatt interjected, responding brazenly.

"Agency, personality, and imagination have long been debunked theories. Humans once believed that they had control over their own brain machinations, a belief that they used to justify their own existence and moral superiority to all other creatures in the universe. It has long been proven that agency, personality, and imagination were the brain's way of allowing time for the neurons to consider all possible outcomes and select the outcome that was the most likely to prolong cell replication and survival. Projecting the relative influence of immediate decisions on ultimate survival is extremely complex, and intellectual inefficiencies have always existed. But no one can ever really *choose* an option that the brain had determined to be less than optimal. No one can really *imagine* something that came from outside the neural network, even if the computation was so complex that the solution *feels* imagined."

CHAPTER 2

Although the last question from the presentation was a bit ridiculous, there was something about the student's sincerity with his question that struck Zara, and she grew skeptical of Dr. Wyatt's confidence in responding. Zara could not help but feel uncertain. Zara dreaded feeling uncertain, as much as she dreaded anything.

She and her partner, Nick, were watching a rendering of *Interstellar* together, a movie from Earth's 21st century, but Zara was hardly attentive.

Nick Coper had been selected for Zara as a partner many years ago. Coming from different galaxies, their genetic diversity had the highest probability of producing offspring with disease resistance. The disappointing result of Albert's birth had taught Zara that randomness always ruled– Father Sigma had been as much a parent of Albert's as herself and Nick, she would say.

"Why are they going to Mann's planet? They don't even consider Edmunds's planet that seriously... Zara?"

"Sorry?" Zara focused.

"Why are they going to Mann's planet?"

She had remembered enough from their previous viewings to respond. They had watched *Interstellar* several times together- she liked analyzing the theory of gravity discussed in the movie while Nick enjoyed cheering for Brand to find her lost love interest, Dr. Edmunds.

Zara responded "They liked Mann's planet because the data from that planet was favorable for survival. But their intellect failed to consider the bias of who produced the report of Mann's planet, and they didn't put much effort into reviewing it for reasonableness. A surprising oversight given that they applied more appropriate skepticism towards Brand's advocacy for visiting Edmunds's planet."

Nick leaned toward Zara and rubbed his hands on the top of her thighs. "Do you realize how sexy you are when you drone on about bias and data quality?" he teased.

Zara smiled politely but showed little response.

"Why don't you look at something with me?" Nick said, sensing that Zara could use some cheering.

Nick pointed. "It's really amazing, you should see it. It's from ice crystals that melted in light simulations of the suns of 38 different galaxies. It reminds me of how we're all connected-"

Zara turned toward the near room where her son Albert spent most of his time. He had been doing more crystal paintings.

“It’s great.” Zara said blankly.

“I’ve never known you to be disappointed by Albert’s art.” Nick replied, upset by Zara’s lack of reciprocal enthusiasm.

“There’s never going to be a place for him in the universe. He’ll never have the intelligence to contribute meaningfully. It would take too long even if he used Neurosync when it gets approved. He wouldn’t have started young enough.”

The echoes of Zara’s footsteps as she paced in the room grew louder.

She thought about the contest Albert had competed in a few years ago. She had initially believed that Albert stood very little chance; in fact, the contest was meant for individuals with high intellectual component levels for spacial awareness and perception.

“Play the art contest.” Nick spoke to the void of space, as if he was reading Zara’s thoughts. A rendering displayed of the two of them and Albert holding a diamond trophy.

“How did he do it?” Nick said rhetorically.

“We know how he did it. The contestants are usually space designers and architects. They work in sigma-minimized capsules because they need to be exact. Albert obviously does not. This increased the Brownian Motion of the light particles in the supernova, and resulted in the dispersion of color that ultimately won the judges over.”

Nick loved Zara, but he did not necessarily enjoy precise and detailed responses every time he asked a question, especially rhetorical ones.

“Yes, but Albert seemed to know how to manipulate the sigma, or at least he was willing to try something that other people weren’t.”

“Nick, please. You know how you do this. Albert isn’t special, he was just in the right place at the right time.” Although Zara was speaking to Nick, she felt as though she was talking to herself.

CHAPTER 3

Zara felt strange the next day as she was arriving to her post at Multiview corporation. Her mind was still racing. She thought of the student from the other day, Albert, and Neurosync. The thoughts were all floating in the same nebulous cloud and she thought there was a relationship between them, but she did not know what that relationship was.

She did not even notice that the stars outside the corporate center had formed the rarely appearing constellation of *Pavo*, which resembled a colorful bird from ancient Earth. Nor did she even look at the TI-34XS Multiview Calculator statue in the main room, which she liked to do every day. One of her great ancestors was an oracle (or "actuary" as it was called then), and she knew that they used those calculators as a primitive computing device. "How could anyone ever do this job with that technology?" she would always say.

She was surprised to see Tera, the grid engineer, when she arrived in the dimensional transfer room.

"Is the sigma high today?" Zara said.

"All over the galaxy. One of those days." Tera affirmed.

All places of the known universe had safety measures implemented to handle periods when Chebyshev's sigma was elevated. At Multiview, this meant that anyone using a dimensional transfer room to access the grid would be monitored by a supervising engineer.

This was comforting to Zara, since the sigma could explain her racing thoughts.

"Just be careful in there." Tera warned, though he knew that he did not need to explain further to Zara of all people.

It was the day's task for Zara to review more trial results of Neurosync. She was to confirm that the Neurosync had worked as intended, and that the magnitude of deviation from expected results over all trials was approximately equivalent to Chebyshev's sigma. She hated describing the results that way, since Chebyshev's sigma was not a constant. They had a feel for what it should be, but no one knew the exact value, and no one could. It could, and often did, vary from trial to trial or environment to environment. She did not like it when she had to rely on a "feeling" of what a number was, even if she had as much of a good sense for it as anyone.

She stood on her usual platform in the transfer room and spread her hands and legs. A helmet descended from the area above her head and suit parts similarly were stuck to her arms, legs, back, and torso.

She placed her hand on the button on her helmet. *Click*. Suddenly her mind exited her body and became the grid.

A relatively new technology, the grid helped Multiview ascend to the most advanced corporation in the known universe and create the miracle therapy Synsync. Computing machines were designed to increase the scalar power of human intellect, but they had long been limited to only multiplying the portion of the human intellect that could be articulated and defined in mathematical logic. After many generations of study, the definition of the brain had improved dramatically, but there was always a part of the intellect that the best scientists, including Dr. Wyatt herself, had never been able to define. Humans survived in a five-dimensional space, not a sigma-less one, and the brain must be suited for it. What that meant exactly, no one knew for sure, they just knew they did not know.

But the grid changed that. By allowing the machine to *become* the mind and vice-versa, it could skip any required definitions and simply magnify what it was given, including both the definable and *undefinable* portions of human intellect.

Engineers had difficulty defining the grid precisely when it interlocked with someone like Zara. It was not entirely human nor entirely machine, nor was it anywhere, nor was it everywhere. It certainly was not a "cloud," which is how Zara's ancestors attempted to explain computers that they did not understand. The only definable separation of Zara from the grid while in interlocked status was the primary and foreign keys, of which the grid was always aware, and an outside observer could see displayed on the monitor. And that was good enough, the rules of referential integrity were always strictly enforced, and Zara's mind could be placed as it was back in the body as long as the key relationship was available.

Because sigma was high that day, the grid decided to perform its review of the Neurosync trials in a series of batches over distributed storage systems to limit the possibility of failure due to environmental variance or "machine noise" as they called it. Each batch would contain a certain set of trial reports, and each set would iterate over several epochs to calibrate its estimate of deviation from Chebyshev's sigma.

Tera monitored the process over the course of the day, and it mostly ran smoothly.

Tera continued to read the external display after each batch "Chebyshev's sigma for trial = 0.0516, Chebyshev's sigma for trial = .0515, Chebyshev's sigma for trial = .0518, Chebyshev's sigma for trial = 0.7167, Chebyshev's sigma for trial = 0.7238." Tera knew enough about Chebyshev's sigma to recognize that the results in the last batches were concerning. He then reviewed the log report. "Warning 11: Chebyshev's sigma exceeds recommended bound… Error 8: Many-to-many matching not allowed: matching labels must be unique on one side." Tera gasped and quickly exited the dimensional transfer room.

CHAPTER 4

Zara awoke, fully lucid. Expecting to be back in the dimensional transfer room, she realized she was still interlocked with the grid, or perhaps she was inside of it.

She panicked, knowing something was wrong. Lucidity was not expected when using the grid.

WOOSH!

It felt as though the grid's data was all processing at once as it appeared to swirl around her mind's presence ceaselessly.

Zara was both separate from the grid and interlocked with it at the same time. She was still able to use and access the grid's data.

She felt as though she had a fever. She could hear fans attempting to cool her in the background, but her condition was worsening.

"Perhaps I should try putting the data into a data warehouse," she thought. As a building structure appeared to form in front of her, data began filling into the building's rooms. There was a key that the data could use to access the building entrance, another key to access the given floor, and yet another key to access a given room. A datum would be placed inside a room and could be located or queried by using the keys.

While some of the data placed neatly in the warehouse, a significant amount remained swirling in the area outside the building and she was still running a fever.

"Right. Some of the data is not relational. I need to use something else."

The data began exiting the building as the building crumbled.

SPLASH!

Suddenly, Zara felt herself swimming and struggling to stay afloat inside a lake of data. At least this had cooled her down and the swirling had stopped.

She started to feel a current in the lake and began following it. She could see the water falling from a cliff.

The current continued to increase in strength. As she followed it, Zara realized the water was falling into a void of space, the dimensions of which resembled a black box.

Fearing the worst, Zara swam as fast she could in the opposite direction. But it was no use, the current's strength had overcome her, and she fell with it over the cliff.

The space was dark, and she could not see anything. However, she could hear the lake emptying over the cliff into the space.

When the sound of the lake had stopped, she saw around her infinitely many flashing lights. Some sparkled, some flied from one place to the next, some disappeared. There appeared to be no observable pattern.

This continued for some time until suddenly all she could see and hear was her own memory.

The first memory appeared to her.

> *Zara and Nick listened intently to the intelligence scan director.*
>
> *"It's called irregular adaptiveness disorder. We know that those with the disorder have significant reduced intellectual efficiency compared to their peers. The result of the intelligence scan shows that Albert has reduced intellectual efficiency and will for the rest of his life.*
>
> *What this means exactly can differ from person-to-person. We see that the afflicted usually do not experience pain and can care for themselves, but they may think and communicate in a significantly inefficient way."*
>
> *"How did this happen?" Zara and Nick sat stunned. Their genetic material was nearly a perfect match.*
>
> *The director paused.*
>
> *"We only have theories at this point, but we know a lot more than we did even just a few years ago. You probably know that these diagnoses are becoming more common.*
>
> *Genetic selecting for mates intends to avoid situations where the partners each carry the same recessive genes for a given trait. This results in fewer births where all the genes for a particular trait are recessive, and, since most diseases result from recessive gene matching, fewer births in disease states."*
>
> *The director emitted an audible sigh.*
>
> *"It was believed that genetic selecting, when applied over many generations, would reduce the frequency of disease states.*
>
> *But we may have been wrong about that.*
>
> *Diseases, maladies, and significant performance deficiency have always been part of the human experience. We thought that evolutionary patterns showed a preference for eradicating these instances as much as possible, but it appears that to some extent, they may have been preferred."*
>
> *"What do you mean? Why?" Zara asked.*
>
> *"The "why" is not really understood yet. It may have been the body's natural attempt to respond to sigma. Given that the magnitude and nature of sigma changes over time, the*

body may feel that it needs to adapt its genetic profile and prefer traits that were not previously preferable under the prior environmental sigma. Consider also that we may be living in different galaxies, each with different sigma, compared to our ancestors.

Anyway, when we have partners who pass only a minimal number of recessive genes to their offspring, and this process is repeated over many generations, the result is that children become less and less likely to have any recessive genes at all.

During fertilization, if there are not many recessive genes that could be selected, the body appears to mutate and create its own. The unique genes can result in neurological divergences."

Zara could feel a great sadness and frustration. As an oracle, Zara felt particularly driven to understand what she could do to help Albert. For all other problems in her life, she could reach achievement by mathematical definition – relating an effect to a cause. But there was something about Albert that was mysterious to her, and there was nothing more provocative than the idea something she loved so greatly could exist outside the definable dimensions of reality.

Another memory appeared.

Zara watched as Albert played with a few of his friends. They were playing "force ball," a game where each player defended a line and attempted to force a ball across the other players' lines. Each player wielded a series of high-density objects ("black holes" they were called in the game) and would use the objects to pull the gravitational field around the ball. Most of the fun occurred when the fields of the black holes would cross paths and create chaotic directional forces, sending the ball floating in many different paths.

When Albert played "force ball," he would make many strategical errors and violate the game's rules due to his lack of understanding. His friends still loved playing with him, though. They would usually stop pursuing their objectives during gameplay so they could watch Albert play with his black holes. It felt each time he played he had found something unique about how the black holes worked. In this instance, his friends were delighted when Albert had split the ball into two parts. He had stacked a series of black holes with varying density together and pushed the planes together around the ball. To the explanation of no one, including Zara, this made it appear as though the inner part of the ball was on a different plane of sigma than the other part. Albert appeared enthralled with how the inner part of the ball would change shape and squeeze in attempt to escape the less chaotic outer part of the ball that contained it.

Zara, Nick, and the nurses had all been surprised watching Albert grow into young adulthood. He would never be in a particularly respectable societal contribution position, and he failed to understand language and mathematics. The therapists would say he had depression and anxiety, likely from feeling misunderstood and his inability to communicate. But amidst this, he seemed to really appreciate his life. There would be things that still captured his fascination, things that most others had previously dismissed. Zara had to admit that there was nothing quite like the cheer those moments gave her.

While Zara enjoyed reliving this moment, she began to consider revising some of her own assumptions about Albert. A lot of the moments when he appeared particularly fascinated was when something random would occur, like during the art contest or when playing force ball. Were these ways that Albert was trying to tell her something?

This memory faded and another appeared. She recognized the boy in the memory as the student from her presentation with Dr. Wyatt.

"Please state your name and relationship to Sol."

"Luna, brother."

"Thank you, Luna. I'm going to ask you a series of questions about your sister's progress with Neurosync treatments. This is to help us give a complete picture of how the treatments have impacted her. There is no right or wrong answer. OK?"

"OK." Luna responded cautiously.

"How would you describe your relationship with your sister?"

"We are twins… she has always been my favorite person."

"How would you rate your ability to communicate with Sol since the treatments began? Better, worse, about the same?"

Luna took a long pause.

"Would you like me to repeat-"

"Better." he interjected.

"How would you rate Sol's ability to perform tasks expected of her at home? Better, worse, about the same?"

"Better."

"Great. And how do you feel Sol does at school now? Better, worse, about the same?"

"Better."

"Does it seem like Sol has more friends since she started treatment?"

Luna was contemplative.

"Does it seem like Sol has more friends since she started treatment?"

"In a way."

"Please define."

"I guess what I mean is she fits in better. She can do the activities that other people do, that she couldn't do previously. But there are things that she did before that she doesn't do now."

“Please explain.”

“It’s hard to say exactly. Sol was kind of different before, and she isn’t different now… Like when we were in school Sol would lose focus while the teacher was speaking, and she would suddenly yell to everyone “look at the comet!” and everyone would laugh. We’ve all seen comets before, it was just funny that she thought it was worth interrupting the lecture, something no one else would feel was appropriate. Then the teacher would say that he could always count on Sol to brighten our day. She doesn’t do that anymore. She focuses on what the teacher says, and she learns just as well as anyone and she doesn’t get distracted.”

“Great, that is what we are trying to accomplish.”

Luna paused, looked out the window, and saw the sunset. The night’s darkness had begun creeping into the room.

“I suppose you’re right.” he said hesitantly.

Why was Zara seeing all these things? Was she sure they were all her memories, or were they from the grid? It felt as though she was inside an infinitely large network of her own neurology, one that the grid was computing for her and producing an output. Like a dream, the result was frustratingly non-mathematical, instead a series of symbols that needed interpretation.

Finally, a figure appeared to her. The figure appeared to be male and had an unusual aesthetic. White, frizzly hair and a strong mustache with heavy wrinkles around his eyelids and on his forehead. Most men in Zara’s time were at least 6’5”, this man was much shorter. For a long time, Zara looked straight ahead at him. He stood in silence, right eyebrow raised and left eyebrow flat. It was like he knew Zara had an important decision to make, and he was waiting for her to do so.

After a long period of this stare, he playfully and suddenly stuck his tongue out at Zara and raised his eyebrows as if to smile.

Then, Zara lost awareness and everything around her became dark.

CHAPTER 5

Zara woke again.

“Zara! Oh thank God- I was so worried. I came as soon as I could.” Nick said.

“What happened?” she asked.

“There was a referential integrity error, and we couldn’t see your key on the display. Sometimes this can happen if a grid user loses their key value. It would mean that your own neurology got mixed up with the grid’s and there wouldn’t be a way to distinguish you from the grid. Did you experience anything unusual?” Tera, also in the room, asked.

“It was unusual, for sure. Hard to describe exactly.” Zara replied, still becoming aware of her current surroundings. “How did you fix it?”

“The same way any human has since computers were first used. We turned it off and turned it back on.” Tera gave a half-smile. “That reset the environment, and everything appeared normal again. Must have just been noise in the machine.”

“Can you just give us a few moments please?” Zara asked.

Tera nodded and exited the room.

“Zara I’m glad you’re ok. They said that this is all normal and something they are prepared for, but when they told me they were restarting the grid with you still in it, it sounded bad. But I guess they know what they are doing.”

Zara did not respond.

“I know you want to keep working on Neurosync, but I think you should take a break for a while. They’ve waited this long, what’s a little while longer?”

Zara sat silent for a long while.

“Nick, do you remember telling me that your grandparents would say something to you when you were little right before your rest period? Can you say it to me again?”

Confused, Nick replied “The most beautiful experience we can have is the mysterious.”

CHAPTER 6

Much time had passed since the incident at the grid, and Zara had a chance to finish her report and assessment of the Neurosync trials. There were very few other hiccups with the grid and the trials gave a clear indication of the efficacy and safety of the therapy. But Zara felt afraid. She had long comforted on top the bed of mathematical proof, but now lied sleeplessly as the monster of lucidity awoke from its dormancy beneath her.

She sat at home with these thoughts as she watched Albert draw. She felt something comforting about describing how she felt to someone who could not understand the words she was using.

“Albert. I’ve really admired you for the strength you have shown in your life. I’m sorry that we couldn’t have helped you sooner.”

Albert continued drawing with his typical blank expression.

“I wish I could be more like you. I wish I had your sense of wonder, your lack of fear of failing, and your excitement for what’s unknown. And your friends love spending time with someone as unique as you.”

Zara felt her courage building, finally able to articulate her feelings.

“At least we will be able to help other children and other parents. And maybe, in a smaller way, we can help you too.”

Albert did not respond.

“Albert, do you think this is what you want me to do? I wish just for once you could understand me.”

Albert stopped. He turned toward Zara, revealing his finished drawing. Zara could see herself standing with Nick and Albert, and Albert was holding a diamond trophy.

Contemplating for some time, she looked at the drawing. Then, she looked back at Albert. It was always difficult to understand Albert’s body language, but she understood it now. One eyebrow raised, one eyebrow flat, suggestively, Albert continued to stare at her.

She began to cry, overwhelmed by her emotions. There was something remarkable about the drawing that smacked her in the face as if she had just fallen off her platform onto the floor. Everything that she once understood and spent most of her career pursuing suddenly seemed trivial. Albert was unique and remarkable, and that was the most important thing in her life.

“Perhaps I understand more about Chebyshev’s sigma than I thought I did,” she realized.

Zara became aware of the illumination from a few of Albert’s light designs that were on display in the edge of the room. The crispness of Zara’s shadow satisfied her. In particular, its rigidity gave the

figure clarity and focus, and the unique shapes and curves of the shadow distinguished it as her own.

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