

The Shadow Postulates

by [Yoon Ha Lee](#)

Kaela Navus was reading a beginners' sword-dancing manual when a hand descended upon her own, blotting out the diagram. She looked up, mouth opening in protest, only to have the scroll plucked from her grip and rolled shut. The black lines faded into ricepaper-white. "Teris!" Kaela said.

Her roomsister, Teris Tascha, set the scroll down on the escritorio out of Kaela's reach. "You won't learn the pattern for the Swallow Flies Home from a diagram," she said. "It has to live in your muscles."

Kaela felt the heat in her face and averted her gaze, but did not argue the point. Of this year's magistrate-aspirants at the Black College, she was the least comfortable with the required physical disciplines. She would rather have been working on her thesis if it hadn't been for the difficulty her research topic was giving her. The college did not specifically ask magistrate-aspirants to learn sword-dancing, but since Teris had agreed to teach her, she had chosen it instead of any number of more staid alternatives, like archery or dance.

"Come on," said Teris. She nudged Kaela into standing up. Teris was the taller of the two, with great dark eyes and bright hair that she kept pinned up so it wouldn't get in her way. She was Kaela's only roomsister, although the Black College preferred to group its magistrate-aspirants in threes. One had dropped out during the first term. Teris compensated for the absence by venturing into the city most evenings, while Kaela was relieved, and spent her free hours in the garden or library.

Teris said, "Let's go through the Swallow Flies Home — only this time I'll mime, and you'll use my blades." She unsheathed one of the two blades at her hip and held it out. "The balance will be close to your practice-sticks, Kaela. Go ahead."

Although Teris was right, Kaela flinched from the weight of steel, the shining edge separated from her grip only by the slender, flower-embossed circle of metal. She accepted the second blade with better grace, wondering how she could apologize for her awkwardness.

"Just hold them for a few minutes until you get used to them," Teris said. And, after the tension in Kaela's arms and shoulders began to ease, "Ready?"

Kaela felt far from ready. She had put off purchasing her own brace of blades, despite having saved enough to do so, for this very reason. Nevertheless, she could not bring herself to turn away from her roomsister's encouraging smile. "Ready."

The first time through, sweating and trembling, she halted in the middle of the gliding steps through which she and her partner would exchange positions. Only the nakedness of her embarrassment kept her from blurting out, "I'm sorry," or "I can't," or some excuse. She had danced this pattern before, not clumsily, but not expertly either. She had done this before. Just not with blades.

Kaela started over, and her roomsister moved in perfect accompaniment. At the point where she had stopped earlier, exhilaration overtook her. The blades were in her hands, and Teris did not even have practice sticks. She did not have to worry about miscalculating and getting cut by a lunge, although Teris's reflexes were good enough to prevent such an occurrence. Through the weight of metal, the momentum of their turns as their shadows performed a projection of their dance across the floor and upon the wall, Kaela imagined that she tasted migration toward a season of beauty and poise.

The pattern ended. Kaela returned to the room, to the blades, to Teris's delighted smile.

"That was splendid," said Teris. "I don't know why I didn't think of it earlier."

"Think of what?"

Teris gestured toward the blades, although she seemed in no hurry to retrieve them. "Letting you wield them for the sword-dance. It's different, you see, even if you use the heavy wooden knife-sticks. You know what I mean, now."

Despite an unexpected reluctance to surrender the blades, Kaela did just that. She did not trust herself with them at the moment; she did not trust her voice or even her hands. She hoped that her eyes conveyed gratitude rather than giddy madness. And her hands no longer trembled. They must have stopped during the pattern, without her awareness.

Unfazed by Kaela's momentary muteness, Teris resheathed the blades with an admirable nonchalance, and smiled again. Neither of them glanced toward the scroll with its absent manual.

After that, Kaela returned to studying for the week's exam in judicial theory. She had neglected to do so earlier because she was puzzling over the problem of the shadow postulates, which she had brashly submitted as her research topic, and later because she had decided that, after months of dead-end possibilities, she would rather learn sword-dancing. She was paying for it now.

Tonight, she would rather have hidden in her room and studied. The Black College was hosting a trio of visiting scholars, however, and since the dinner talk was on mathematics, her specialty, she could not absent herself. Teris had disappeared after their practice session, heading for a festhall sword-dance with her lover, a college technician who shared her enthusiasm for the physical disciplines. Kaela envied them their revelry, even though she shied away from that bright, barbaric atmosphere.

Trapped at dinner, Kaela toyed with her chopsticks and reviewed canonical decisions while a senior magistrate introduced the scholars. When her seatmates started giving her irritated looks, she switched to teasing apart a tassel on her floor-cushion to keep herself awake.

Three scholars, the ever-present convention of rhetorical balance, in contrast to the undiluted pairing of the sword-dance, relic of earlier, more warlike traditions. The second scholar, at least, had an animated face and voice in contrast to the pedantry of the first. Even so, she felt her attention drifting. Maybe she should buy a new floor-cushion for her room, one with many silk tassels for the unraveling. On second thought, maybe not. Teris was sensitive to small nervous motions, but was too polite to protest. Kaela tried to return the courtesy by stilling herself. The sword-dancing did help reduce her jitteriness.

When the scholar went into a digression on mirror dynamics, Kaela sat straighter, the tassel forgotten. This intersected her research topic, after all.

"— what the mirror-war revealed," said the scholar by way of conclusion, "is that the relationship between source and image is mediated by these dynamics. An invisible third presence, if you like, satisfying the rule of three for Vorief's framework."

Kaela shivered at the name. Anje Vorief's studies in entelechy had resulted in near-instant communications and the ready production of silhouettes, which displaced scribes and the necessity of large-scale printing. They had also led to the continent's only mirror-war, which started with the assassination of several public figures by paring away their reflections hour by hour until they wandered lost in iterations of shattered identity and died.

Nevertheless, now that safeguards existed against those abuses, Vorief's treatise, *When Shadows Walk Into the World*, was required reading at the Black College. Magistrates had a long history of primitive applications of entelechy theory, as the college's procession of shades showed. All magistrate-aspirants were warned that the shades, which belonged to past magistrates, paid them especial scrutiny. The shades' demands for inhuman honesty had driven careless aspirants into safer academic pursuits.

The third scholar had finished speaking. Kaela's body begged for sleep. She stayed just long enough to show courtesy to the visitors before fleeing to her empty room. Tassels and their shadows, forming unbreakable knots on the walls, twined in her dreams.

"I'm hungry," Kaela said after her roomsister prodded her awake.

Teris gave her an exasperated look. "I bet you didn't remember to eat anything at dinner. I saved you a pastry from breakfast, but your tea's no longer hot."

"You're too splendid for words, Teris." Kaela didn't mind lukewarm tea.

Teris sniffed, but the crook of her mouth suggested she was not unflattered. "How was the talk?"

"The parts of it I was awake for? There were some interesting things about how mathematical applications affect the propagation of legal norms, models for ethical calculus, that sort of thing."

Teris had started stretching, palms to feet, and she straightened herself before saying, "Nothing controversial, then. I wish they would inflict these itinerant scholars on us less often. Let them ponder philosophy and leave applications to us."

"I'm sure they think their work is important. At least we're exposed to judicial research from all over the continent. Unless you think we should be sheltered from different paradigms until we have more experience?"

"See what happens when I give you a pastry? It's restday and here you are starting a policy discussion without a third participant."

Kaela changed the subject, despite her roomsister's teasing tone. "How was the festhall."

"Ever so refreshing after poring over documents." She resumed her stretches, recounting the pleasure of her lover's surety of form, the consuming dream of motion they shared.

Soon sorry she had asked, Kaela made noncommittal noises in response. She thought Teris spent too much time trying to impress the technician. Still, she enjoyed watching her roomsister's lithe motions, although the topic of conversation had stifled her desire to join in the stretches.

Reluctantly, Kaela looked away and reviewed the last two days of notes, even if it was restday. She lost herself in her research problem. The shadow postulates, although they dated from an earlier era, extended the Vorief framework. Like those before her, Kaela suspected that the third of the three postulates, which dealt with incorporeal consequences, could be derived from the rest of the extended framework.

As a magistrate-aspirant, Kaela could have submitted a less abstruse, more *practical* research topic. The point was to prove herself capable of basic research methods, no more. Many scholars had lost years in the postulates' intricacies only to peel away into related studies. Kaela was too stubborn to admit that this might happen to her.

Last week, her sponsor, the senior scholar Roz Roven, had reminded her that she needed to submit a draft of her thesis by the end of this term. "I know you've sworn yourself to this," he said, "but you're running short of time. You may have to settle for a less ambitious problem. You won't be the first." The words belied the regret in his gaze, that the student he had taken in on account of her early promise should fall short, as he had decades ago.

Kaela found the prospect of his disappointment unbearable, even if the third shadow postulate was one of the outstanding problems in entelechy theory. Stymied, she wondered what had prompted the magistrate Brien, several hundred years dead, to append the postulates to a mundane schedule roster. Records from that time, according to Teris, spoke of war between nations now united. Of Brien, they said little concerning mathematics. In his time, he had befriended a traitor and the traitor's innocent lover, herself a magistrate. Beyond that, Kaela had never been able to follow the intricacies of intrigue.

If more of Brien's writings had survived, the shadow postulates might not have become such an enduring puzzle. Kaela shook her head. Too bad the magistrates' shades communicated through cryptic gestures and never in words, or she — and generations of mathematicians before her — would have asked Brien's faceless shade the everlasting *why*?

Although Teris invited her to a feshall dance after dinner, Kaela refused. "I might head out before dinner and eat there," Teris said, disappointed but forgiving, as always. "Don't worry about me, sister-mine."

Kaela could no more stop worrying about her roomsister than she could stop fidgeting. Since she delighted in symmetry, she saved tea and riceballs from dinner just in case. They grew cold as she hunched over her notes.

When the equations started to blur, she conceded that this was doing her no good. In a fit of recklessness, she shrugged on a shabby wool coat, located her boots, and ventured out of the room. Shadows clung to her footsteps. She shivered.

Fear of shadows was a common student phobia. During curfew hour, wherever light lived, shades paced along the college's walls and through its gardens. They were instantiations of past magistrates, a phenomenon from the Black College's earliest days. New students received the curfew-bell schedule upon arrival so they knew when to be wary. Rumors abounded of students losing parts of their reflections, or speaking in voices of dust and smoke, or getting lost on paths they had walked a hundred times, ending up on rooftops or behind doors that, once exited, were never to be seen again. According to the college, the curfew hours were the outgrowth of a religious practice to honor the shades. Teris had opined, when they first met, that it was really to keep revelers from irritating the shades into starting a second mirror-war.

Kaela, startled out of being intimidated by her new roomsister's confident bearing, asked, "Wouldn't it make more sense to have an all-night curfew, then? And aren't the shades only abroad during those particular hours?"

"Nothing ruins a judgment like the facts," said Teris, and they both laughed. That was when Kaela decided she might be able to share a room with Teris without stammering every time Teris glanced her way.

In any case, none of the shades troubled Kaela as she threaded her way from campus to city. The quarter that surrounded the Black College had its share of street lights, hazing the stars' distant shine. Kaela coughed behind her sleeve at the mingling of smoke, perfume, and cheap vintages with bouquets obscured beyond recognition. She skirted puddles and shied from laughing men and women who swept

by her with disdainful looks at her clothing. *Student*, their glances judged her, *and poor at that*. Both were true enough, and she was not Teris to challenge them in her turn.

As Kaela was about to pass the first festhall, she realized she had forgotten which one Teris had said she would be at, or whether, indeed, she might not drift among several in the course of the night. This only firmed her determination. Kaela sought her roomsister at the more reputable festhalls that mushroomed around the college. Even then, the noise from the doorways appalled her.

She found no sign of Teris's bright hair amid the crowds. Men propositioned Kaela, or offered dances or drinks, but she refused them with polite phrases, unmoved by smiles or inviting eyes. Her training in sword-dancing helped her elude those who became more insistent before they could grab her arm or swing her close.

After a while, Kaela gave up and retraced her route, unwilling to check rowdier possibilities. She credited Teris with better taste. Obsessive about detail, she checked the festhalls in reverse order as she went. In the Spinning Rose, she found Teris Tascha at last.

The beat of hand-drums warned her of the sword-dance within, and her hands clenched in the folds of her coat. The rhythms, whose syncopation she analyzed instinctively, drew her toward the open entrance, the hushed voices, the lanterns blossoming in bold colors. She did not belong here, despite the invitation, but Teris — Teris was another matter.

Kaela edged into the Spinning Rose, and saw Teris with that bright-spun hair caught up in combs and beaded ribbons, blades gleaming in her hands. Across from Teris was the technician, likewise lithe, his motions timed to hers. Kaela was unable to remember his name, but here names didn't matter. Teris and her lover did not see the watcher by the doorway, shaking and flushed, wordless. Their gazes were locked upon each other, but what they saw, Kaela realized, was not each other, only the dance's precise symmetries, the parabolic flight of flung blades, the coordination of movement with the drums' insistent voices.

Enraptured by Teris's laughing eyes and quickened breath, those choreographed geometries, Kaela almost stepped farther into the festhall, ready to meet the eyes of an unpartnered dancer and offer herself to the dance. The spinning blades, which would once have tightened her throat with dread, now reflected light into patterns that tugged at her hands, her feet, the pulse in her veins.

Then Kaela remembered that she had no blades of her own, because purchasing a brace would have meant committing herself to this bright, barbarous dance. If she walked a little closer and caught Teris's attention with the plea in her eyes, Teris would smile at the technician and draw away from him to loan Kaela her blades for a dance or two with the unthinking generosity she had always shown. Teris wouldn't mind; would, in fact, be delighted to see her roomsister join the dance at last. Kaela could not, however, bring herself to interrupt the pair, so splendidly matched, for her own brash pleasure. She left the festhall, and no one marked her departure.

Shaken, Kaela did not think to check the hour before she ventured back on campus. The street lights stretched shadows into spindly mockeries. Although no one shared the path with her, other shadows moved purposefully, undistorted by exigencies of distance and angle. Since she was halfway to her dormitory, she hastened rather than turning back.

Between one step and the next, a magistrate's shade brushed her shadow. For a terrible, unblinking moment, she understood the principle by which Vorief's framework could be used to kill from a distance, understood it in a visceral manner that her first-term reading of the treatise had failed to convey. What was a shadow, after all, but a shape in the moving world reduced to a projection of possibilities?

The dead magistrate had made his choices, Kaela was given to understand, and those choices collapsed into the single sharp fact of his death, the face of unflinching truth. What would her shade reveal after her heartbeat stilled?

She saw her life flattened to an ink-blot, her own shadow beginning to peel into shapes she did not want to confront, and fled the rest of the way to her room. Her hands shook as she spread her sleeping mat, and in the darkness, she laced her fingers together to still them. Only shadows, she told herself over and over as she sought sleep. Only shadows.

Kaela did not mention the Spinning Rose to her roomsister that day or the next or the next after that, even during sword-dancing practice. She reread *When Shadows Walk Into the World*. She performed flawlessly on her next exam, which concerned the comparative history of execution and exile, although after she handed it in, she could not recall any of the questions, much less her responses. And, Teris told her one morning, she began talking in her sleep.

"What have I been saying?" Kaela demanded.

"Mathematical things," Teris said, and recited some of them back to her.

She relaxed, then wondered why she had been tense. "Oh, that. I've been trying to reformulate Brien's notation. I swear there's something going on with those definitions, if I could just see what he was doing. The entelechy framework didn't exist while he lived, so that third postulate must have seemed necessary to him. Why is it so hard to figure out how to derive it?" She swallowed. "I haven't been keeping you up, have I?" Kaela slept deeply, so Teris's comings and goings rarely woke her, but the reverse was not true.

Teris, in the process of unpinning her hair to brush it out before breakfast, paused and shook her head. The tangles were almost copper in the lamplight. "No. I'm just worried about you. I can't say I understand your research, but you've got to ease up on yourself."

Kaela averted her gaze from her roomsister's earnest eyes. "I'm nearing the deadline for that rough draft, and my notes, the structures I see, they don't quite come together. As if there's a gap, and I should know the shape of the bridge."

"Even so." Teris passed the brush from hand to hand with unthinking precision. "Tomorrow, instead of your paper, promise me you'll do something that hasn't the slightest relationship to research. Sit in the library and read torrid love poetry if that's what it takes. It'll help. You'll see."

"I want to buy my own blades," Kaela blurted out.

Forever after, Kaela would remember that her roomsister's expression, rather than being surprised or amused or smug, became thoughtful and not a little pleased. "Tomorrow, hells. We can go shopping after breakfast, if you like. Neither of us has class today until the afternoon, is that right?"

"Yes," said Kaela, thinking that, with blades of her own, she need no longer fear shadows.

That evening, and the evenings afterward, Kaela and Teris, both wielding steel, practiced true sword-dances. Teris showed her new exercises to ease her out of her self-consciousness. It helped for a while. She would never equal her roomsister's shining poise, but she approached it in her own slow way. Sometimes, laying alone in the darkness with the blades beneath her pillow, she even forgot her encounter with the magistrate's shade.

Scant weeks remained before her draft was due. Kaela resumed murmuring in her sleep. Teris continued to invite her to festhall sword-dances, but Kaela's fear of shadows held her fast. Finally, she retreated to the Black College's library after dinner to avoid the invitation, telling herself she needed to concentrate. As she slipped between the shelves, she avoided looking at the shreds of her shadow along the interstices of wall and floor. Teris, she was sure, had never struggled with phobia in her life.

She stopped by the shelves that housed the Black College's history and counted backwards by decades until she found the era during which magistrate Brien had held office. So few volumes to encompass the long dance of lives, all reprinted via silhouette. Originals that old were stored elsewhere, and here the usual must of aging paper was replaced by a cleaner smell.

Kaela knew that she would find little on Brien here; she had already looked. Her roomsister, better trained in historical methodology, would have told her if anything useful appeared elsewhere. Who had Brien's friend the traitor been, and what had he betrayed? She should have paid more attention, even if it seemed like gossip too ancient to have any relevance, especially to mathematics.

"Brien," she said into the rows of listening books, tasting the name. The ancient gossip had once been anything but ancient or irrelevant; had captured three people, at least, in its knots. She did not know what they had looked like or what their voices sounded like. She did not know the touches they exchanged or failed to exchange.

The archivist on duty, bemused by Kaela's interest, found no contemporary portraits of the three, but located a later woodprint of the execution, called *Between Shadows*. The first thing Kaela noticed was the utter absence of blades in the picture, although even today, full magistrates carried a ritual sword of office. "Who is who?" Kaela asked, captivated by the stark stiff lines and shadows, the contrasting fluidity of the falling leaves that framed the scene.

"Rahen the Traitor," said the archivist, pointing to the man who stared defiantly from the center of the picture, hands bound behind him. "Magistrate Kischa." A woman with a river-fall of dark hair around her averted face, to Rahen's left. "Magistrate Brien." A thin man with no expression except in his hands, with his fingers laced together. In those tense hands, Kaela, who had learned to read stances as a sword-dancer, saw a cry too broken for other expression.

And all around them, the falling leaves, each three-lobed. No, shreds of leaves. Even Kaela understood that symbolism, the implication of death and divided lives. She thanked the unknown artist for being straightforward.

The archivist said, "Shall I make you a silhouette of this?"

"Yes," Kaela said. "Oh, yes." Brien had a face now. She would settle for that.

She made it back to her room with a half hour to spare before curfew, clutching the woodcut-silhouette all the way. She laid it atop her escritoire and studied it more closely. For all she knew, the artist had invented the faces. But those tense, anguished hands had a truth in them beyond fact or fancy.

Next to the picture, she laid her silhouette of the shadow postulates in their earliest known formulation, although the archaic notation gave her headaches. Three postulates, braided around each other and into the entelechy framework. Three-lobed leaves. Three people, two lovers, one death.

The bell tolled curfew. Kaela was nowhere near ready to sleep. She stretched, then segued into the Wolf Approaches, miming the blade. Her shadow partnered her, a solitary shape against the wall. She stopped. No. Without Teris, it wasn't the same.

"I am not afraid," Kaela said to her shadow.

Kaela repeated the stretches to keep her muscles from knotting up. Idly, letting her mind drift free of her body, she negated the third shadow postulate, then followed the strands of logic in search of the inevitable contradiction. She knew the extended framework as intimately as her hands knew the unruly cascades of her hair. With practiced discipline, she began working through the consequences of a system identical save for that one negated postulate.

There was no contradiction.

Kaela sat before the escritoire. She laid her hands on her notes, intending to make sure she was remembering the postulates correctly, then snatched them back before they clenched and crumpled the sum of her work. Her gaze fell again on the woodcut-silhouette with its border of falling leaves.

No. She had not misremembered.

It was as though, having lived all her life in the belief that roomsisters or roombrothers must come in threes, she discovered they could live in pairs, as with herself and Teris, or quartets. The Black College organized itself around a rule of three, but why not a rule of two, or four?

A person cast one and only one shadow under most circumstances, but in the darkness, no shadows lived; in the light of several lanterns, shadows proliferated. Each scenario, for a given set of light sources, was equally valid. And so it was with the third shadow postulate.

Two shadows crossing and uncrossing while she watched, breathless, from the doorway of the Spinning Rose.

"Teris," Kaela breathed, eyes widening. She was in love with Teris Tascha, despite the sister-taboo.

Falling leaves, three-lobed leaves. Brien must have loved his friend's lover, the woman with the long, dark hair, although it had gone unwritten and Kaela, in the absence of textual evidence, would never be able to prove it.

Kaela began writing, scarcely conscious of her pen's outpouring. She knew the shape of the entelechy framework and the alternate structures that would result from the variations on that third, mutable postulate, from its possible negations. She knew, too, that she could not articulate the key insight, the silent cry that Brien had left within the single language abstract enough to trust with his anguish at standing outside his friends' romance.

Perhaps Brien had executed the traitor, friend and rival both, with a traitorously glad heart himself. Perhaps he had wished to discard himself in the traitor's place, after seeing what the execution did to that dark-haired woman. The artist, in drawing Brien's fingers as a cage of tension, convinced Kaela that the latter was closer to the truth.

Kaela remembered the name of Teris's lover, but it didn't matter. She put down her pen. Now that she understood what she had overlooked, she had time to formulate a coherent thesis. Roz Roven, her sponsor, would be pleased.

She also understood that she could never mention her insight to Teris in a language that the other woman could fathom. Kaela had no desire to break the paired beauty of hand meeting hand, blade meeting blade, to step between two sword-dancers' shadows intersecting beneath the eyes of light. But she could find her own dance.

I have loved you in your own language, Kaela thought as she picked up her blades, *so softly that we*

never knew it. Let your language be mine; let me cast my own shadows.

No shadows interrupted her all the way through curfew hour that night as she walked to the Spinning Rose, or any night thereafter.

For Alex Winbow, with apologies to Fermat and Euclid's Fifth.