

The book cover features a dramatic, apocalyptic scene. A large, jagged black silhouette of a head is superimposed over the background. Inside the head's eye area, a bright, fiery orange sphere is visible. The background is a mix of dark, smoky clouds and a bright, blue and white nebula-like structure. A large, dark, spherical object is visible in the upper right corner. The overall color palette is dominated by reds, oranges, and yellows, suggesting fire and destruction.

CIXIN LIU

HUGO AWARD WINNING AUTHOR

TRANSLATED BY KEN LIU

DEATH'S END



DEATH'S END

Cixin Liu

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[About *Death's End*](#)

Half a century after the Doomsday Battle, the Dark Forest Deterrence keeps the Trisolaran invaders at bay.

It is an uneasy balance, but the infusion of Trisolaran knowledge has triggered an era of unprecedented prosperity on Earth. With human science advancing and the Trisolarans adopting Earth culture, it seems that the two

civilizations can co-exist peacefully as equals without the terrible threat of mutually assured annihilation. But has peace also made humanity complacent?

Cheng Xin, an aerospace engineer from the 21st century, awakens from hibernation into this new age. She brings knowledge of a long-forgotten program dating from the start of the Trisolar Crisis, and her presence may fatally upset the delicate balance between two worlds.

The universe is a dark and dangerous place, devoid of mercy or sentiment.

Will humanity reach for the stars or die in its cradle?

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Chinese and Korean names in this text are rendered with surnames first and given names last, in accordance with the customs of these cultures. For example, in the name “Yun Tianming,” YUN is the surname and TIANMING is the given name.

CHARACTERS FROM *THE THREE-BODY PROBLEM* AND *THE DARK FOREST*

(Chinese names are written with surname first.)

Ye Wenjie

Physicist whose family was persecuted during the Cultural Revolution. She initiated contact with the Trisolarans and precipitated the Trisolar Crisis.

Yang Dong

Physicist; daughter of Ye Wenjie.

Ding Yi

Theoretical physicist and the first human to make contact with the Trisolaran droplets; Yang Dong’s boyfriend.

Zhang Beihai

Officer in the Asian Fleet who hijacked *Natural Selection* during the Doomsday Battle, thus preserving a flicker of hope for humanity during

their darkest hour. Possibly one of the first officers to understand the nature of dark battles.

Secretary General Say

UN secretary general during the Trisolar Crisis.

Manuel Rey Diaz

Wallfacer; he proposed the giant hydrogen bomb plan as a defense against the Trisolarans.

Luo Ji

Wallfacer; discoverer of the dark forest theory; creator of dark forest deterrence.

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[*Time*](#)

I suppose this ought to be called *history*; but since all I can rely on is my memory, it lacks the rigor of history.

It's not even accurate to call it the *past*, for the events related in these pages didn't occur in the past, aren't taking place now, and will not happen in the future.

I don't want to record the details. Only a frame, for a history or an account of the past. The details that have been preserved are already abundant. Sealed in floating bottles, they will hopefully reach the new universe and endure there.

So I've written only a frame; someday, the frame may make it easier to fill in all the specifics. Of course, that task won't fall to us. I just hope such a day will come for someone.

I regret that day didn't exist in the past, doesn't exist in the present, and will not exist in the future.

I move the sun to the west, and as the angle of the light shifts, the dewdrops on the seedlings in the field glisten like countless eyes suddenly popping open. I dim the sun so that dusk arrives earlier; then I stare at the silhouette of myself on the distant horizon, in front of the setting sun.

I wave at the silhouette; the silhouette waves back. Looking at the shadow of myself, I feel young again.

This is a lovely time, just right for remembering.

[PART I](#)

[May 1453, C.E. The Death of the Magician](#)

Pausing to collect himself, Constantine XI pushed away the pile of city-defense maps in front of him, pulled his purple robe tighter, and waited.

His sense of time was very accurate: The tremor came the moment he expected it, a powerful, violent quake that seemed to originate from deep within the earth. The vibrating silver candelabra hummed, and a wisp of dust that had sat on top of the Great Palace for perhaps a thousand years fell

down and drifted into the candle flames, where the motes exploded in tiny sparks.

Every three hours—the time it took the Ottomans to reload one of the monstrous bombards designed by the engineer Orban—twelve-hundred-pound stone balls battered the walls of Constantinople. These were the world's strongest walls: first built by Theodosius II during the fifth century, they had been continually reinforced and expanded, and were the main reason that the Byzantine court had survived so many powerful enemies. But the giant stone balls now gouged openings into the walls with each strike, like the bite of an invisible giant. The emperor could imagine the scene: While the debris from the explosion filled the air, countless soldiers and citizens rushed onto the fresh wound in the walls like a swarm of brave ants under a sky full of dust. They filled in the break with whatever was at hand: bits and pieces taken from other buildings in the city, flaxen-cloth bags of earth, expensive Arabic carpets.... He could even imagine the cloud of dust, steeped in the light of the setting sun, drifting slowly toward Constantinople like a golden shroud.

During the five weeks the city had been under siege, these tremors had come seven times a day, spaced as regularly as the strokes of some colossal clock. This was the time and rhythm of another world, the time of heathens.

Compared to these tremors, the ringing of the double-headed eagle copper clock in the corner that represented the time of Christendom seemed feeble. The tremors subsided. After a while and with an effort, Emperor Constantine pulled his thoughts back to the reality before him. He gestured to let the guard know that he was ready for his visitor.

Phrantzes, one of the emperor's most-trusted ministers, came in with a slender, frail figure trailing close behind.

"This is Helena." Phrantzes stepped aside, revealing the woman.

The emperor looked at her. The noblewomen of Constantinople tended to favor clothes bedecked with elaborate decorative elements, while the commoners wore plain, shapeless white garments that draped to the ankles.

But this Helena seemed a combination of both. Instead of a tunic embroidered with gold thread, she wore a commoner's white dress, but over it she draped a luxurious cloak; however, instead of the purple and red reserved for the nobility, the cloak was dyed yellow. Her face was enchanting and sensual, bringing to mind a flower that would rather rot in adoration than fade in solitude.

A prostitute, probably one who did rather well for herself.

Her body trembled. She kept her eyes lowered, but the emperor noticed that they held a feverish glow, hinting at an excitement and zeal rare for her

class.

“You claim the powers of magic?” the emperor asked.

He wanted to conclude this audience as quickly as possible. Phrantzes was usually meticulous. Of the approximately eight thousand soldiers defending Constantinople now, only a small number came from the standing army, and about two thousand were Genoese mercenaries.

Phrantzes had been responsible for recruiting the rest, a few at a time, from the city’s inhabitants. Though the emperor wasn’t particularly interested in his latest idea, the capable minister’s standing demanded that he at least be given a chance.

“Yes, I can kill the sultan.” Helena’s quiet voice quivered like silk strands in a breeze.

Five days earlier, standing in front of the palace, Helena had demanded to see the emperor. When guards tried to push her away, she presented a small package that stunned the guards. They weren’t sure what she was showing them, but they knew it was not something she should have possessed. Instead of being brought to the emperor, she had been held and interrogated about how she had acquired the item. Her confession had been confirmed, and she was then brought to Phrantzes.

Phrantzes now took out the small bundle, unwrapped the flax cloth, and

placed the contents on the emperor's desk.

The emperor's gaze was as stupefied as those of the soldiers five days ago. But unlike them, he knew immediately what he was looking at.

More than nine centuries earlier, during the reign of Justinian the Great, master craftsmen had cast two chalices out of pure gold, studded with gems and glowing with a beauty that seized the soul. The two chalices were identical save for the arrangement and shapes of the gems. One of the two was kept by successive Byzantine emperors, and the other one had been sealed along with other treasures into a secret chamber in the foundation of Hagia Sophia in 537 C.E., when the great church was rebuilt.

The glow of the chalice in the Great Palace that the emperor was familiar with had dulled with the passage of time, but the one in front of him now looked so bright it could have been cast only yesterday.

No one had believed Helena's confession at first, thinking that she had probably stolen the chalice from one of her rich patrons. Although many knew of the secret chamber under the great church, few knew its exact location. Moreover, the secret chamber was nestled among the giant stones deep in the foundation, and there were no doors or tunnels leading to it. It should have been impossible to enter the chamber without a massive engineering effort.

Four days ago, however, the emperor had ordered the precious artifacts of the city collected in case of Constantinople's fall. It was really a desperate measure, as he understood very well that the Turks had cut off all routes leading to the city, and there would be nowhere for him to escape with the treasures.

It had taken thirty laborers working nonstop for three days to enter the secret chamber, whose walls were formed from stones as massive as those in the Great Pyramid of Cheops. In the middle of the chamber was a massive stone sarcophagus sealed shut with twelve thick, crisscrossing iron hoops. It took most of another day to saw through the iron hoops before five laborers, under the gaze of many guards, finally managed to lift the cover off the sarcophagus.

The onlookers were amazed not by the treasures and sacred objects that had been hidden for almost a thousand years, but by the bunch of grapes placed on top, still fresh.

Helena had claimed to have left a bunch of grapes in the sarcophagus five days ago, and as she had declared, half of the grapes had been eaten,

with only seven left on the stem.

The workers compared the treasures they recovered against the listing

found on the inside of the cover of the stone sarcophagus; everything was accounted for except the chalice. If the chalice hadn't already been found with Helena, and without her testimony, everyone present would have been put to death even if they all swore that the secret chamber and the sarcophagus appeared intact.

"How did you retrieve this?" the emperor asked.

Helena's body trembled even harder. Apparently, her magic did not make her feel safe. She stared at the emperor with terror-filled eyes, and squeezed out an answer. "Those places... I see them... I see them as..." She struggled to find the right word. "...open...."

"Can you demonstrate for me? Take out something from inside a sealed container."

Helena shook her head, dread stilling her tongue; she looked to Phrantzes for help.

Phrantzes spoke up. "She says that she can only practice her magic in a specific place. But she can't reveal the location, and no one must be allowed to follow her. Otherwise the magic will lose its power forever."

Helena nodded vigorously.

"In Europe, you would already have been burned at a stake," the emperor said.

Helena collapsed to the ground and hugged herself. Her small figure looked like a child's.

“Do you know how to kill?” the emperor pressed.

But Helena only trembled. After repeated urgings from Phrantzes, she finally nodded.

“Fine,” the emperor said to Phrantzes. “Test her.”

Phrantzes led Helena down a long flight of stairs. Torches in sconces along the way cast dim circles of light. Under every torch stood two armed soldiers whose armor reflected the light onto the walls in lively, flickering patterns.

Finally, the two arrived at a dark cellar. Helena pulled her cloak tighter around her. This was where the palace stored ice for use during the

summers.

The cellar held no ice now. A prisoner squatted under the torch in the corner; an Anatolian officer, based on the way he was dressed. His fierce eyes, like a wolf's, glared at Phrantzes and Helena through the iron bars.

“You see him?” Phrantzes asked.

Helena nodded.

Phrantzes handed her a sheepskin bag. “You may leave now. Return with

his head before dawn.”

Helena took out a scimitar from the bag, glinting in the torchlight like a crescent moon. She handed it back to Phrantzes. “I don’t need this.”

Then she ascended the stairs, her footfalls making no sound. As she passed through the circles of light cast by the torches, she seemed to change shape—sometimes a woman, sometimes a cat—until her figure disappeared.

Phrantzes turned to one of the officers: “Increase the security around here.” He pointed to the prisoner. “Keep him under constant observation.”

After the officer left, Phrantzes waved his hand, and a man emerged from the darkness, draped in the black robes of a friar.

“Don’t get too close,” Phrantzes said. “It’s all right if you lose her, but do not under any circumstances let her discover you.”

The friar nodded and ascended the stairs as silently as Helena had.

That night, Constantine slept no better than he had since the siege of Constantinople began: The jolts from the heavy bombards woke him each time, just as he was about to fall asleep. Before dawn, he went into his study, where he found Phrantzes waiting for him.

He had already forgotten about the witch. Unlike his father, Manuel II, and elder brother, John VIII, Constantine was practical and understood that

those who put all their faith in miracles tended to meet with untimely ends.

Phrantzes beckoned at the door, and Helena entered noiselessly. She looked as frightened as the last time the emperor had seen her, and her hand shook as she lifted the sheepskin bag.

As soon as Constantine saw the bag, he knew that he had wasted his time. The bag was flat, and no blood seeped from it. It clearly didn't contain the prisoner's head.

But the expression on Phrantzes's face wasn't one of disappointment. Rather, he looked distracted, confused, as though he was walking while dreaming.

"She hasn't retrieved what we wanted, has she?" the emperor asked.

Phrantzes took the bag from Helena, placed it on the emperor's desk, and opened it. He stared at the emperor as though he was looking at a ghost.

"She almost did."

The emperor looked inside the bag. Something grayish and soft was nestled on the bottom, like old mutton suet. Phrantzes moved the candelabra closer.

"It's the brain of that Anatolian."

"She cut open his skull?" Constantine glanced at Helena. She trembled in her cloak like a frightened mouse.

“No, the corpse of the prisoner appeared intact. I had twenty men observe him, five men per watch, keeping him in their sight from different angles. The guards at the cellar door were also on extra alert; not even a mosquito could have entered the space.” Phrantzes paused, as though stricken by his own memories.

The emperor nodded at him to continue.

“Two hours after she left, the prisoner went into sudden convulsions and fell down dead. Among the observers at the scene were an experienced Greek doctor and veterans of many battles—none could recall anyone dying in this particular manner. An hour later, she returned and showed them this bag. The Greek doctor then cut open the corpse’s skull. It was empty.”

Constantine observed the brain in the bag: It was complete, showing no signs of damage. The fragile organ must have been retrieved with great care. Constantine focused on Helena’s fingers grasping the lapels of her cloak. He imagined the slender fingers reaching forward, picking a mushroom nestled in the grass, picking a fresh blossom from the tip of a branch....

The emperor lifted his gaze up toward the wall, as though observing something rising over the horizon beyond. The palace shook with another pounding from the gigantic bombards, but, for the first time, the emperor

did not feel the tremors.

If there really are miracles, now is the time for them to manifest.

Constantinople was in desperate straits, but not all hope was lost. After five weeks of bloody warfare, the enemy had also suffered heavy casualties. In some places, the Turkish bodies were piled as high as the walls, and the attackers were as exhausted as the defenders. A few days ago, a brave fleet from Genoa had broken through the blockade of the Bosphorus and entered the Golden Horn, bringing precious supplies and aid. Everyone believed that they were the vanguard of more support from the rest of Christendom. Morale was low among the Ottoman camps. Most commanders secretly wanted to accept the truce terms offered by the Byzantine court and retreat. The only reason the Ottomans had not yet retreated was because of a single man.

He was fluent in Latin, knowledgeable about the arts and sciences, skilled in warfare; he had not hesitated to drown his brother in a bathtub to secure his own path to the throne; he had decapitated a beautiful slave girl in front of his troops to demonstrate that he could not be tempted by women.... Sultan Mehmed II was the axle around which the wheels of the Ottoman war machine revolved. If he broke, the machine would fall apart.

Perhaps a miracle truly has manifested.

“Why do you want to do this?” the emperor asked. He continued to stare at the wall.

“I want to be remembered.” Helena had been waiting for this question.

Constantine nodded. Money or treasure held no allure for this woman; there was no vault or lock that could keep her from what she desired. Still, a prostitute wanted honor.

“You are a descendant of the Crusaders?”

“Yes.” She paused, and carefully added, “Not the fourth.”

The emperor placed his hand on Helena’s head, and she knelt.

“Go, child. If you kill Mehmed II, you will be the savior of Constantinople, and be remembered as a saint forever. A holy woman of the Holy City.”

At dusk, Phrantzes led Helena onto the walls near the Gate of St. Romanus. On the ground near the walls, the sands had turned black with the blood of the dying; corpses were strewn all over as though they had rained down from the sky. A bit farther away, white smoke from the giant cannons drifted over the battlefield, incongruously light and graceful. Beyond them, the Ottoman camps spread as far as the eye could see, banners as dense as a forest flapping in the moist sea breeze under the lead-gray sky.

In the other direction, Ottoman warships covered the Bosphorus like a field of black iron nails securing the blue surface of the sea.

Helena closed her eyes. *This is my battlefield; this is my war.*

Legends from her childhood, stories of her ancestors recounted by her father, surfaced in her mind: In Europe, on the other side of the Bosphorus, there was a village in Provence. One day, a cloud descended on the village, and an army of children walked out of the cloud, red crosses glowing brightly from their armor and an angel leading them. Her ancestor, a man from the village, had answered their call and sailed across the Mediterranean to fight for God in the Holy Land. He had risen through the ranks and become a Templar Knight. Later, he had come to Constantinople and met a beautiful woman, a holy warrior; they had fallen in love and given birth to this glorious family....

Later, when she was older, she had found out the truth. The basic frame of the story was true: Her ancestor had indeed been a member of the Children's Crusade. It was right after the plague had swept through the villages, and he had joined in the hope of filling his belly. When the man had gotten off the boat, he found himself in Egypt, where he and more than ten thousand other children were sold as slaves. After many years of bondage, he escaped and drifted to Constantinople, where he did indeed

meet a woman warrior, a holy knight. However, her fate wasn't much better than his. The Byzantine Empire had been hoping for the elite troops of Christendom to fight off the infidels. Instead, they received an army of frail women as poor as beggars. The Byzantine court refused to supply these "holy warriors," and the women knights became prostitutes.

For more than a hundred years, Helena's "glorious" family had barely eked out a living. By her father's time, the family's poverty had grown even more acute. A hungry Helena picked up the trade practiced by her own illustrious ancestor, but when her father found out, he had beaten her, telling her that he would kill her if he ever caught her again... unless she took her clients back home so that he could negotiate a better price and keep the money "for her."

Helena left home and began to live and ply her trade on her own. She had been to Jerusalem and Trabzon, and even visited Venice. She was no longer hungry, and she dressed in beautiful clothes. But she knew that she was no different from a blade of grass growing in the mud by the road: indistinguishable from the muck, as travelers trampled over her.

And then, God granted Helena a miracle.

Even then, she didn't model herself after Joan of Arc, another woman who had been divinely inspired. What had the Maid of Orléans received

from God? Only a sword. But God had given Helena something that would make her into the holiest woman besides Mary....

“Look, that’s the camp of *el-Fātiḥ*, the Conqueror.” Phrantzes pointed away from the Gate of St. Romanus.

Helena glanced over and nodded.

Phrantzes handed her another sheepskin bag. “Inside are three portraits of him from different angles and in different clothing. I’ve also given you a knife—you’ll need it. We need his entire head, not just the brain. It’s best if you wait until after nightfall. He won’t be in his tent during the day.”

Helena accepted the bag. “You remember my warning.”

“Of course.”

Don’t follow me. Don’t enter the place where I must go. Otherwise the magic will stop working, forever.

The spy who had followed her last time, in the guise of a friar, had told Phrantzes that Helena had been very careful, turning and looping back on her own path multiple times until she arrived in the Blachernae quarter, the part of the city where bombardment from the Turkish cannons was heaviest. The spy had watched as Helena entered the ruins of a minaret that had once been part of a mosque. When Constantine had given the order to destroy the mosques in the city, this particular tower had been left alone

because, during the last plague, a few diseased men had run inside and died, and no one wanted to get too close. After the siege began, a stray cannonball had blown away the top half of the minaret.

Following Phrantzes's admonition, the spy had not entered the minaret.

But he had questioned two soldiers who had entered it before it had been struck by the stray missile. They told the spy that they had intended to set up a watch station on top of the structure but gave up after realizing it

wasn't tall enough. They told the spy that there was nothing inside except a few bodies that had rotted until they were practically skeletons.

This time, Phrantzes didn't send anyone to follow Helena. He watched as she made her way through the soldiers thronging the top of the walls.

Among the dirt-and-blood-encrusted armor of the soldiers, her bright cloak stood out. But the exhausted soldiers paid her no attention. She descended from the walls, and, without making an obvious effort to throw off anyone who might be following her, headed for the Blachernae quarter.

Night fell.

Constantine stared at the drying water stain on the floor, a metaphor for his vanishing hope.

The stain had been left by a dozen spies. Last Monday, dressed in the uniforms and turbans of the Ottoman forces, they had sneaked through the blockade in a tiny sailboat to welcome the European fleet that was supposed to be on its way to relieve the siege of Constantinople. But all they saw was the empty Aegean Sea, without even a shadow of the rumored fleet. The disappointed spies had carried out their duty and made their way back through the blockade to bring the emperor the terrible news.

Constantine finally understood that the promised aid from Europe was nothing more than a dream. The kings of Christendom had coldly decided to abandon Constantinople to the infidels, after this holy city had withstood the tides of Mohammedans for so many centuries.

Anxious cries from outside filled his ears. A guard came and reported a lunar eclipse: a terrible portent. It was said that Constantinople would never fall as long as the moon shone.

Through the narrow slit of the window, Constantine observed the moon disappearing in shadow, as though entering a grave in the sky. He knew, without knowing exactly why, that Helena would never return, and he would never see the head of his enemy.

A day passed; then a night. There was no news of Helena.

Phrantzes and his men stopped in front of the minaret in the Blachernae

quarter and dismounted from their horses.

Everyone was stunned.

Under the cold, white light of the newly risen moon, the minaret appeared complete: Its sharp tip pointed into the starry sky.

The spy swore that the last time he had been here, the minaret's top was missing. Several other officers and soldiers, familiar with the area, corroborated his testimony.

But Phrantzes gazed at the spy in cold fury. No matter how many witnesses testified to the contrary, he must certainly be lying: The complete minaret was ironclad proof. However, Phrantzes had no time to mete out punishment; now that the city was about to fall, no one would escape the punishment of the Conqueror.

A soldier off to the side knew that the missing top of the minaret hadn't been destroyed by a cannonball. He had found the top half of the minaret missing one morning two weeks ago. There had been no cannon fire the previous night, and he had recalled that there was no debris on the ground around the minaret. The two soldiers who had been with him that morning had both died in battle. However, seeing the look on Phrantzes's face, he decided to keep quiet about it.

Phrantzes and his men entered the bottom of the minaret. Even the spy

who Phrantzes was sure had lied came along. They saw remnants of the corpses of plague victims that had been scattered around the ruin by feral dogs, but there were no signs of anyone living.

They ascended the stairs. In the flickering torchlight on the second story, they saw Helena curled under a window. She appeared to be asleep, but her half-closed eyes reflected the light from the torches. Her clothes were torn and dirty and her hair unkempt; a few bloody scratch marks crossed her face, perhaps self-inflicted.

Phrantzes looked around. This was the top of the minaret, an empty, cone-shaped space. He noted the thick layer of dust covering everything, but there were few marks in the dust, as though Helena, like them, had arrived only recently.

She awoke, and, scrabbling at the walls with her hands, stood up.

Moonlight falling through the window turned the messy hair around her face into a silvery halo. She stared, wide-eyed, and seemed to return to the present only with effort. But she then closed her eyes again, as though trying to linger inside a dream.

“What are you doing here?!” Phrantzes shouted at her.

“I... I can’t go *there*.”

“Where?”

With her eyes still half closed, as if to savor her memory like a child holding on to a favorite toy that she would not give up, she answered, “There’s so much space there. So comfortable...” She opened her eyes and looked around in terror. “But here, it’s like the inside of a coffin, whether I’m inside the minaret or outside. I have to go *there!*”

“What about your mission?”

“Wait!” Helena crossed herself. “Wait!”

Phrantzes pointed outside the window. “It’s too late for waiting.”

Waves of noise cascaded over them. If one listened carefully, two sources could be distinguished.

One source was from outside the city. Mehmed II had decided to launch the final assault on Constantinople tomorrow. At this moment, the young sultan was riding through the Ottoman camps, promising his soldiers that all he wanted was Constantinople itself—the treasure and women of Constantinople would belong to his army, and after the fall of the city, the soldiers would have three days to loot everything they desired. All the soldiers cheered at the sultan’s promise, and the sound of trumpets and drums added to their glee. This joyous din, mixed with the smoke and sparks rising from fires in front of the camps, covered Constantinople like an oppressive tide of death.

The noise coming from inside Constantinople, on the other hand, was lugubrious and subdued. All the citizens had paraded through the city and gathered at Hagia Sophia to attend a final Mass. This was a scene that had never occurred and would never occur again in the history of Christianity: Accompanied by solemn hymns, under the light of dim candles, the Byzantine emperor, the Patriarch of Constantinople, Orthodox Christians of the East and Catholics from Italy, soldiers in full armor, merchants and sailors from Venice and Genoa, and multitudes of ordinary citizens all gathered in front of God to prepare for the final battle of their lives.

Phrantzes knew that his plan had failed. Perhaps Helena was nothing but a skilled fraud, and she possessed no magic at all—he preferred that possibility by far. But there was another, more dangerous alternative: She did possess magic, and she had already gone to Mehmed II, who had given her a new mission.

After all, what could the Byzantine Empire, teetering on the brink of ruin, offer her? The emperor's promise to make her into a saint was unlikely to be fulfilled: Neither Constantinople nor Rome was likely to declare a witch and a whore a saint. Indeed, she had likely returned with two new targets in mind: Constantine, and himself.

Hadn't Orban, the Hungarian engineer, already been an example of this?

He had come to Constantine first with plans for his giant cannons, but the emperor had no money to pay his salary, let alone finance the construction of such monstrous engines. He had then gone to Mehmed II, and the daily bombardments had served as a constant reminder of his betrayal.

Phrantzes looked over at the spy, who immediately unsheathed his sword and stabbed at Helena's chest. The sword pierced her body and got stuck in a crack in the wall behind her. The spy tried to pull the sword out, but it wouldn't budge. Helena rested her hands on the sword's hilt. The spy let go of the weapon, unwilling to touch her hands.

Phrantzes left with his men.

Throughout her execution, Helena never made any noise. Gradually, her head drooped, and the silvery halo formed by her tresses fell away from the beam of moonlight and faded into darkness. The moon's glow lit a small patch of ground in the dark interior of the minaret, where a stream of blood flowed like a slender, black snake.

In the moments that preceded the great battle, noises from both inside and outside the city stopped. The Eastern Roman Empire welcomed its last dawn on this Earth, at the intersection of Europe and Asia, of land and sea. On the second story of the minaret, the woman magician died, pinned to the wall. She was perhaps the only real magician in the entire history of the

human race. Unfortunately, ten hours earlier, the age of magic, brief as it was, had also come to an end.

The age of magic began at four o'clock on the afternoon of May 3, 1453, when the high-dimensional fragment first intersected with the Earth. It ended at nine o'clock on the evening of May 28, 1453, when the fragment left the Earth behind. After twenty-five days and five hours, the world returned to its normal orbit.

On the evening of May 29, Constantinople fell.

As the bloody slaughter of the day was coming to its inevitable end, Constantine, faced with the swarming Ottoman masses, shouted, "The city is fallen and I am still alive." Then he tore off his imperial robe and unsheathed his sword to meet the oncoming hordes. His silvery armor glinted for a moment like a piece of metallic foil tossed into a tub of dark red sulfuric acid, and then vanished.

The historical significance of the fall of Constantinople would not be apparent for many years. For most, the obvious association was that it marked the final gasp of the Roman Empire. Byzantium was a thousand-year rut behind the wheels of Ancient Rome, and though it enjoyed splendor for a time, it finally evaporated like a water stain under the bright sun. Once, ancient Romans had whistled in their grand, magnificent baths,

thinking that their empire, like the granite that made up the walls of the pools in which they floated, would last forever.

No banquet was eternal. Everything had an end. Everything.

[Crisis Era, Year 1 The Option for Life](#)

Yang Dong wanted to save herself, but she knew there was little hope.

She stood on the balcony of the control center's top floor, surveying the stopped particle accelerator. From her perch, she could take in the entire twenty-kilometer circumference of the collider. Contrary to usual practice, the ring for the collider wasn't an underground tunnel, but enclosed within an aboveground concrete tube. The facility looked like a giant full stop

[mark in the setting sun.*](#)

What sentence does it end? Hopefully only the end of physics.

Once, Yang Dong had held a basic belief: Life and the world were perhaps ugly, but at the limits of the micro and macro scales, everything was harmonious and beautiful. The world of our everyday life was only froth floating on the perfect ocean of deep reality. But now, it appeared that the everyday world was a beautiful shell: The micro realities it enclosed and the macro realities that enclosed it were far more ugly and chaotic than the shell itself.

Too frightening.

It would have been better if she could just stop thinking about such things. She could choose a career that had nothing to do with physics, get married, have children, and live a peaceful, contented life like countless others. Of course, for her, such a life would be only half a life.

Something else also bothered Yang Dong: her mother, Ye Wenjie. By accident, she'd discovered on her mother's computer some heavily encrypted messages that she had received. This aroused an intense curiosity in Yang.

Like many elderly people, Yang's mother wasn't familiar with the details of the web and her own computer, so she had only deleted the decrypted documents instead of digitally shredding them. She didn't realize that even if she had reformatted the hard drive, the data would still have been easily recoverable.

For the first time in her life, Yang Dong kept a secret from her mother, and recovered the information in the deleted documents. It took her several days to read through the recovered information, during which she learned a shocking amount about the world of Trisolaris and the secret shared by the extraterrestrials and her mother.

Yang Dong was utterly stunned. The mother she had depended on for most of her life turned out to be someone she didn't know at all, someone

she couldn't even have believed existed in this world. She didn't dare to confront her mother, never would, because the moment she asked about it, her mother's transformation in her mind would be complete, irrevocable. It was better to pretend that her mother was still the person she had always known and continue life as before. Of course, for Yang, such a life would be only half a life.

Was it really so bad to live only half a life? As far as she could see, a considerable number of the people around her lived only half lives. As long as one was good at forgetting and adjusting, half a life could be lived in contentment, even happiness.

But between the end of physics and her mother's secret, Yang had lost two such half lives, which added up to a whole life. What did she have left? Yang Dong leaned against the banister and stared at the abyss beneath her, terrified as well as enticed. She felt the banister shake as it bore more of her weight, and she stepped back as though shocked by electricity. She dared not stay here any longer. She turned to walk back into the terminal room.

This was where the center kept the terminals for the supercomputer used to analyze the data generated by the collider. A few days ago, all of the terminals had been shut down, but now a few were lit. This gave Yang

Dong a bit of comfort, but she knew that they no longer had anything to do with the particle accelerator—other projects had taken over the supercomputer.

There was only one young man in the room, who stood up as Yang Dong came in. He wore glasses with thick, bright green frames, a distinct look. Yang explained that she was here only to retrieve a few personal items, but after Green Glasses heard her name, he became enthusiastic and explained the program running on the terminals to her.

It was a mathematical model of the Earth. Unlike similar projects in the past, this model combined factors from biology, geology, astronomy, atmospheric and oceanic sciences, and other fields of study to simulate the evolution of the Earth's surface from past to future.

Green Glasses directed her attention to a few large-screen displays.

These did not show scrolling columns of numbers or crawling curves on a chart; instead, they showed bright, colorful pictures, as though one were viewing the continents and oceans from high above. Green Glasses manipulated the mouse and zoomed in on a few places to show close-up views of a river or a copse of trees.

Yang Dong felt the breath of nature seeping into this place that had once been dominated by abstract numbers and theories. She felt as if she were

being released from confinement.

After the explanation from Green Glasses, Yang Dong retrieved her things, politely said good-bye, and turned to leave. She could feel Green Glasses staring at her back, but she was used to men behaving this way, so instead of being annoyed, she felt comforted, as if by sunlight in winter. She was seized by a sudden desire to communicate with others.

She turned to face Green Glasses. “Do you believe in God?”

Yang Dong was shocked by her own question. But considering the model displayed on the terminals, the question wasn’t entirely out of place.

Green Glasses was similarly stunned. After a while, he managed to close his mouth and ask, carefully, “What kind of ‘God’ do you mean?”

“Just God.” That overwhelming sensation of exhaustion had returned.

She had no patience to explain more.

“I don’t.”

Yang pointed to the large screens. “But the physical parameters governing the existence of life are utterly unforgiving. Take liquid water as an example: It can exist only within a narrow range of temperatures.

Viewing the universe as a whole, this becomes even more apparent: If the parameters of the big bang had been different by even one million billionth, we would have no heavy elements and thus no life. Isn’t this clear evidence

for intelligent design?”

Green Glasses shook his head. “I don’t know enough about the big bang to comment, but you’re wrong about the environment on Earth. The Earth gave birth to life, but life also changed the Earth. The current environment on our planet is the result of interactions between the two.” He grabbed the mouse and started clicking. “Let’s do a simulation.”

He brought up a configuration panel on one of the large screens, a window filled with dense fields of numbers. He unchecked a checkbox near the top, and all the fields became grayed out. “Let’s uncheck the option for ‘life’ and observe how the Earth would have evolved without it. I’ll adjust the simulation to be coarse-grained so as not to waste too much time in computation.”

Yang Dong glanced over at another terminal and saw that the supercomputer was operating at full capacity. A machine like that consumed as much electricity as a small city, but she didn’t tell Green Glasses to stop.

A newly formed planet appeared on the large screen. Its surface was still red-hot, like a piece of charcoal fresh out of the furnace. Time passed at the rate of geological eras, and the planet gradually cooled. The color and patterns on the surface slowly shifted in a hypnotic manner. A few minutes

later, an orange planet appeared on the screen, indicating the end of the simulation run.

“The computations were done at the coarsest level; to do it with more precision would require over a month.” Green Glasses moved the mouse and zoomed in on the surface of the planet. The view swept over a broad desert, over a cluster of strangely shaped, towering mountain peaks, over a circular depression like an impact crater.

“What are we looking at?” Yang Dong asked.

“Earth. Without life, this is what the surface of the planet would look like now.”

“But... where are the oceans?”

“There are no oceans. No rivers either. The entire surface is dry.”

“You’re saying that without life, liquid water would not exist on Earth?”

“The reality would probably be even more shocking. Remember, this is only a coarse simulation, but at least you can see how much of an impact life had in the present state of the Earth.”

“But—”

“Do you think life is nothing but a fragile, thin, soft shell clinging to the surface of this planet?”

“Isn’t it?”

“Only if you neglect the power of time. If a colony of ants continue to move clods the size of grains of rice, they could remove all of Mount Tai in a billion years. As long as you give it enough time, life is stronger than metal and stone, more powerful than typhoons and volcanoes.”

“But the formation of mountains depends on geologic forces!”

“Not necessarily. Life may not be able to uplift mountains, but it can change the distribution of mountain ranges. Let’s say there are three mountains, two of which are covered by vegetation. The one that is nude would soon be flattened by erosion. ‘Soon’ here means on the order of millions of years, a blink of an eye in geological terms.”

“Then how did the oceans disappear?”

“We’d have to examine the records of the simulation, which would be a lot of work. However, I can give you an educated guess: plants, animals, and bacteria all have had important roles in the present composition of our atmosphere. Without life, the atmosphere would be very different. It’s possible that such an atmosphere would not be able to shield the surface of the Earth against solar winds and ultraviolet rays, and the oceans would evaporate. Soon, greenhouse effects would turn the Earth’s atmosphere into a copy of Venus’s, and then water vapor would be lost to space over time. After several billion years, the Earth would be dry.”

Yang Dong said no more as she stared at that yellow husk of a planet.

“Thus, the Earth that we live on now is a home constructed by life for itself. It has nothing to do with God.” Green Glasses held out his arms in mock embrace of the large screen, clearly pleased with his own oration.

Yang Dong was not really in the mood to discuss such matters, but the moment Green Glasses unchecked the option for life in the configuration panel, a thought had flashed into her mind.

She asked the next terrifying question: “What about the universe?”

“The universe?”

“If we use a similar mathematical model to simulate the entire universe, and uncheck the option for life at the beginning, what would the resulting universe look like?”

Green Glasses thought for a moment. “It would look the same. When I talked about the effects of life on the environment, it was limited to the Earth. But if we’re talking about the universe, life is exceedingly rare, and its impact on the evolution of the universe can be ignored.”

Yang Dong held her tongue. She said good-bye again and struggled to put on an appreciative smile. She left the building and stared up at the star-studded night sky.

From her mother’s secret documents, she knew that life was not so rare

in the universe. In fact, the universe was downright crowded.

How much has the universe been changed by life?

A wave of terror threatened to overwhelm her.

She knew that she could no longer save herself. She tried to stop thinking, to turn her mind into empty darkness, but a new question stubbornly refused to leave her alone: *Is Nature really natural?*

*

Translator's Note: The Chinese full stop punctuation mark looks like this:

◦

Crisis Era, Year 4 Yun Tianming

After Dr. Zhang's regular checkup on Yun Tianming, he left a newspaper with him, saying that since Tianming had been in the hospital for so long, he should be aware of what was happening in the world. There was a TV in Tianming's room, so he was puzzled, wondering if perhaps the doctor had something else in mind.

Tianming read the newspaper and came to the following conclusion:

Compared to the time before he was hospitalized, news about Trisolaris and the Earth-Trisolaris Organization (ETO) no longer dominated everything.

There were at least some articles that had nothing to do with the crisis.

Humanity's tendency to focus on the here and now reasserted itself, and

concern for events that would not take place for four centuries gave way to thoughts about life in the present.

This wasn't surprising. He tried to remember what was happening four hundred years ago: China was under the Ming Dynasty, and he thought—he wasn't sure—that Nurhaci had just founded the empire that would end up replacing the Ming, after slaughtering millions. The Dark Ages had just ended in the West; the steam engine wouldn't make its appearance for another hundred-plus years; and, as for electricity, one would have to wait three hundred years. If anyone at the time had worried about life four hundred years later, they'd be a laughingstock. It was as ridiculous to worry about the future as to lament the past.

As for Tianming himself, based on the way his condition was developing, he wouldn't even need to worry about next year.

But one item of news attracted his attention. It was on the front page:

The Special Session of the Third Standing Committee of the National People's Congress Passes Euthanasia Law

Tianming was confused. The special legislative session had been called to deal with the Trisolar Crisis, but this law seemed to have nothing to do with the crisis.

Why did Dr. Zhang want me to see this news?

A fit of coughing forced him to put down the newspaper and try to get some sleep.

The next day, the TV also showed some interviews and reports about the euthanasia law, but there didn't seem to be a lot of public interest.

Tianming had trouble sleeping that night: He coughed; he struggled to breathe; he felt weak and nauseous from the chemo. The patient who had the bed next to his sat on the edge of Tianming's bed and held the oxygen tube for him. His surname was Li, and everyone called him "Lao Li," *Old Li*.

Lao Li looked around to be sure that the other two patients who shared the room with them were asleep, and then said, "Tianming, I'm going to leave early."

"You've been discharged?"

"No. It's that law."

Tianming sat up. "But why? Your children are so solicitous and caring ____"

"That is exactly why I've decided to do this. If this drags out much longer, they'd have to sell their houses. What for? In the end, there's no cure. I have to be responsible for my children and their children."

Lao Li sighed, lightly patted Tianming's arm, and returned to his own bed.

Staring at the shadows cast against the window curtain by swaying trees, Tianming gradually fell asleep. For the first time since his illness, he had a peaceful dream.

He sat on a small origami boat drifting over placid water, oarless. The sky was a misty, dark gray. There was a cool drizzle, but the rain apparently did not reach the surface of the water, which remained as smooth as a mirror. The water, also gray, merged with the sky in every direction. There was no horizon, no shore....

When Tianming awoke in the morning, he was baffled by how, in his dream, he was so certain that *there*, it would always be drizzling, the surface would always be smooth, and the sky always a misty, dark gray. The hospital was about to conduct the procedure Lao Li had asked for. It took a great deal of internal discussion before the news outlets settled on the verb "to conduct." "To execute" was clearly inappropriate; "to carry out" sounded wrong as well; "to complete" seemed to suggest that death was already certain, which was not exactly accurate, either.

Dr. Zhang asked Tianming whether he felt strong enough to attend Lao Li's euthanasia ceremony. The doctor hurried to add that since this was the

first instance of euthanasia in the city, it would be better to have representatives from various interest groups present, including someone representing other patients. No other meaning was intended.

But Tianming couldn't help feeling that the request did contain some hidden message. Still, since Dr. Zhang had always taken good care of him, he agreed.

Afterwards, he suddenly realized that Dr. Zhang's face and name seemed familiar—did he know the doctor before his hospitalization?—he couldn't recall exactly how. The fact that he hadn't had this feeling of recognition earlier was because their interactions had been limited to discussions of his condition and treatment. The way a doctor acted and spoke while performing his job was different from when he spoke as just another person.

None of Lao Li's family members were present for the procedure. He had kept his decision from them and requested that the city's Civil Affairs Bureau—not the hospital—inform his family after the procedure was complete. The new law permitted him to conduct his affairs in this manner. Many reporters showed up, but most were kept away from the scene.

The euthanasia room was adapted from a room in the hospital's emergency department. A one-way mirror made up one of the walls so that observers could see what was happening inside the room, but the patient would not be

able to see them.

Tianming pushed his way through the crowd of observers until he was standing in front of the one-way glass window. As soon as he saw the interior of the euthanasia room, Tianming was seized by a wave of fear and disgust. He wanted to throw up.

Whoever was responsible for decorating this room had made quite an effort: There were new, pretty curtains on the windows, fresh flowers in vases, and numerous pink paper hearts on the walls. But their well-intentioned attempt to humanize the situation had achieved the exact opposite: The frightful pall cast by death was mixed with an eerie cheerfulness, as though they were trying to turn a tomb into a nuptial chamber.

Lao Li was lying on the bed in the middle of the room, and he appeared to be at peace. Tianming realized that they had never properly said goodbye, and his heart grew heavy. Two notaries were inside, finishing up the legal part of the procedure. After Lao Li signed the documents, the notaries came out.

Another man went inside to explain the specific steps of the procedure to Lao Li. The man was dressed in a white coat, though it was unclear whether he was really a doctor. The man first pointed to the large screen at the foot