

Civilization 541

Chapter 541 - Discussion in the Southwest Mountains

The banners flapped in the breeze as the elite samurai ascended silently, letting the mountain wind sweep across them while they watched the sun rise to mid-sky. Only when the king shook the small flag did the trusted aides halt their steps, pausing atop the hill.

Xiulote stood at the summit of the hill, surveying the surroundings. Behind him, the shield guard Ters, with a wooden expression, still held the royal banner aloft.

From the high vantage point, the world seemed to open up, broadening the king's horizons. In the long wind, the hills undulated like towering waves, continuously rising to the mountain peaks; under the sunlight, the land gradually bare, like footprints of the gods, occasionally shimmering with a faint golden light. Only a winding creek flowed tinklingly like a lively snake, tracing the path of the onlookers, converging towards Lake Zirahuen, the lowest point in the terrain.

"What magnificent mountains! What a splendid river! All this wonderful landscape is in my hands!"

The king exclaimed loudly after a moment of gazing. He had inspected farms along the way, witnessed the fruitful earth, and now, having climbed the high mountains to behold the vast rivers and mountains, he felt extremely delighted! However, the instincts of a military leader soon resurfaced, manifesting in a contemplative murmur.

"Qinganbate, gentle mountains... This terrain is so treacherous, easy to defend but hard to attack, not gentle at all!"

"Your Highness is discerning! Qinganbate is indeed a range of treacherous mountains,"

Ezpan, touching his severed left finger, complimented with a clear gaze.

"As for the description of gentle, there is also an ancient legend that corresponds to the relics on the mountains. Legend has it that in the distant ancient times, these mountains were bustling with noise and billowing smoke, serving as the mouth of a demon that devoured mortals, leading to the underworld, the Land of the Dead."

"The demon ravaged for a thousand years, and the thick smoke rose for a thousand years. Until a great Divine Descendant witnessed the evil of this place. He first used human sacrifices to attract the Chief Divine, then resolutely sacrificed himself here. With a thunderous noise that shook heaven and earth, the Divine Descendant sealed the passage to the underworld with his divine body, and since then, the mountains have become gentle..."

"Later, the shameless Divine Eagle Royal Family claimed that it was an ancient Divine Eagle sage who sealed this place... However, only the Chief Divine's supreme power could accomplish all this! It must be the Chief Divine's Divine Descendant who sealed this place!..."

"Hmm, well said!... A smoking demon's mouth? A calmed dormant volcano?"

Listening to this, Xiulote pondered and asked with a smile.

"Ezpan, since this is the demon's mouth, is there the Stone of the Dead?"

"Your Highness is wise! Not only are there copper mines here, but also the Stone of the Dead, which is found at the higher parts of the mountains. Most of the Stones of the Dead used for sacrificial rites in the Capital City, Qinchongcan, come from here!"

"Very good!"

Xiulote nodded in satisfaction. To the east of the lake region lay mountainous saltpeter pits, and to the southwest nearby sulfur deposits. Thus, during the saltpeter collection season of winter, a large-scale production of gunpowder could once again be organized. And once copper cannons and gunpowder were ready... the king, confident, smiled again as he looked down at the mountains and rivers.

"Ezpan, with these rising mountain terrains and river flowing from the mountains, the land is majestic and has a water source. If we were to build a fort and establish a camp here, it would be extremely difficult to conquer!"

"Your Highness is wise! I have spent a long time in these mines. Nearby in the mountains, there are a few abandoned blue stone fortresses, which are tough to conquer. Fortunately, after Your Highness captured the false king of Tarasco, otherwise, if he had fled here, just by holding the camp, he could have blocked the conquering army and comfortably integrated the southwest..."

Ezpan smiled in agreement, also with a sigh.

"It is said that the initial false king of Tarasco stationed his troops here, guarding against the remnants of Urixu in the southwest and the scattered Tekos Barbarians in the mountains. As the kingdom rapidly expanded, the remnants and Barbarians in the mountains were all subdued. The southwest border consistently expanded to the edge of the Colima Mountain Region, about five hundred li away, making these fortresses in the hinterland completely abandoned."

Hearing this, Xiulote showed a reaction. He looked towards the Head Warrior on the other side.

"Bertade, what is the current situation of the Tarasco remnants in the southwest mountains? Have they surrendered?"

"Your Highness, most of the remnants in the southwest have submitted their surrenders. The Lords from various regions also sent Envoys with tributes, nominally submitting to the newly formed Kingdom of the Lake. But in fact, they still maintain their regional autonomy traditions, tightly controlling everything in their fiefdoms."

Bertade pondered for a while, first nodding lightly, then slowly shaking his head. He calmly extended his hand towards the southwest.

"Your Highness, please look, the terrain in the southwest is very fragmented and complex. Interlocking mountains close in the middle to form several lower basins, with scattered towns and villages situated among them. Between the mountain ranges, there are strings of narrow passes that only a few troops need to guard, but it would take a great effort to break through."

"The mountain people here are isolated and cling together, unruly and difficult to tax. The local nobility are also stubborn and self-important, valuing land above all. Once the central government forcefully sends people to manage, it can easily provoke a joint uprising by the mountain people and the nobility. Moreover, the residents of the southwest mountain area are fewer than a hundred thousand, brave and skilled in battle, with rugged terrain and poor land output. Conquering it is very troublesome and there is hardly any wealth to plunder..."

"Overall, the cost of directly governing the southwest far exceeds the benefits of direct rule! The central government of the kingdom has no desire and finds it difficult to establish direct rule. During the period of Taracos, the approach to managing this area was to divide and distribute military nobility, enfeoff compliant local chiefs, using military deterrence on one hand and trade on the other."

Hearing this, Xiulote furrowed his brows. He gazed towards the undulating south, his thoughts drifting far away.

The Pacific Rim Plate and the American Plate collide, forming a chain of volcanic mountains along the western edge of America. With the long-term volcanic activity, the rich mineral deposits from beneath the earth have been brought up to the surface. In Central America, the plate collision created the towering Southern Madre Mountains, which extend and divide the world's southwest into nearly unbridgeable halves, with the Fiefs of the southwest being an extension of the Southern Madre Mountains.

To undertake a campaign from the Patzcuaro Lake Region to the distant Colima Mountain Region, only two routes crossing the mountain range are feasible. The northern route requires assembling a fleet, traveling westward along the Lerma River for five hundred li, conquering the Chapala Lake Region, then turning southwest for four hundred li along the tributaries. The southern route requires traveling through the mountain passes, heading southwest for four hundred li, then turning northwest for another two hundred li.

Overall, although the northern route is longer, it can transport tens of thousands of troops via water. The southern route, saving one-third of the distance, can only accommodate a small number of elite troops through the mountains."

"This situation is very similar to that of the Celestial Empire's southwest!"

Xiulote's expression remained calm, as he gave a self-mocking smile.

"The iron ore in the Colima Mountain Region is like the carrot before the donkey, always visible but unattainable! Even reaching Colima and mining the deep iron ore is a tremendous difficulty... Perhaps I should think of some strategies for North America, where the future border between America and Mexica is a hugely rich mineral belt..."

The King pondered for a while, then asked again.

"Bertade, where exactly can the Fief effectively deploy officials and exert control over its southwestern border?"

The Head Warrior tiptoed, glanced at the nearest basin to the southwest, and cautiously finger-counted before carefully responding.

"Your Highness, the furthest control area in the southwest of the Fief is one hundred and fifty miles southwest of the Capital City, at Urapani City. This is a major town in the western part of Zicao County. Urapani means a plant that flowers and yields fruit in the same season, so it's also known as the 'Flower Fruit City' in the mountains!"

"Flower Fruit City in the mountains?!"

Xiulote paused, a strange twitch forming on his face. He inquired subconsciously.

"Are there many monkeys there?"

"Your Highness is knowledgeable! The southwestern mountains indeed abound with long-haired howler monkeys... and the pineapples they love to eat."

Ezpan stepped forward and continued to praise with a smile.

"Hmm."

The King nodded stiffly. He controlled his expression before asking seriously.

"In that case, beyond the Lake Region's southern plains, the Fief controls only a little over fifty miles of mountainous area. Bertade, the southwestern mountains stretch for four to five hundred miles! Even though the mountain paths are difficult, the Fief should not control merely a small portion. How could the scattered Great Nobility of the southwestern mountains resist tens of thousands of the Kingdom Legion?"

"Your Highness, if willing to endure thousands of casualties, the old nobility of the southwestern mountains indeed couldn't withstand the Legion, and the Kingdom's ruled area could extend another two hundred miles southwest. However, subduing the mountain area wouldn't yield any benefits and effective governance cannot be established quickly. Once the large troops withdraw, the mountain people will surely launch a rebellion again with the support of some interested parties. If troops were stationed in the mountains, the increase in food consumption would double with the lengthening of mountain roads and would also face repeated guerrilla attacks from the mountain people."

Hearing this, Xiulote fell silent in contemplation. Energized, Ezpan stepped forward and volunteered.

"Your Highness is merciful! You do not wish for the warriors to suffer too many casualties. I am familiar with the terrain here and can lead the new Spear Army of Prepetcha to pacify this region for Your Highness! In head-on battles, the mountain people are actually quite weak. As long as we dispatch troops before the autumn harvest and stay for a year, then ruin the mountain people's spring planting next year, their food supply will be depleted. Without food, the mountain people can only submit to the true sun!"

"Destroying autumn harvest and spring planting... Hmm, Ezpan, I see your loyalty and will entrust you with an even more critical task!"

Xiulote looked at Ezpan calmly, touched his shoulder intimately, and softly praised him. Immediately, Ezpan, visibly moved, bowed deeply. Then, the King furrowed his brow and turned to the Head Warrior.

"Bertade, you mentioned 'some interested party's' support? Could it be from the south..."

"Indeed, Your Highness."

The Head Warrior nodded affirmatively.

"Scouts have been reporting back continuously. Over the past few months, there have been some unusual activities in Zicao County to the south. Subjugated old nobles meet frequently, seeming to have formed a loose mutual-aid alliance. They also frequently send envoys to conspire with the nobility of the southwestern mountains."

"These nobles, who dispute and conflict with each other generationally, can only put aside their differences to resist the central pressure. Once the Kingdom Legion gets mired in the mountains, the southern nobility will definitely secretly support the mountains people, divert Your Highness's attention and exhaust the central power as much as possible..."

"Hmm, the old nobility in the south..."

Xiulote asked indifferently.

"Are they planning a rebellion?"

"The campaign to the west just ended, and the Alliance's military exploits are still clearly visible. Unless driven to desperation, they likely lack the courage to rebel."

"What is their breaking point?"

"The land,"

The Head Warrior replied succinctly.

"Land... Land... I will give them another choice. Although the Chief Divine is the War God, He also possesses mercy."

The King, expressionless, had already made up his mind. Although the setting sun bled red across the evening sky, the sun would always bring light!

"I've rested enough, let's continue!"

The marching call echoed vibrantly, resounding across the vast earth. The elite Samurai once again formed into their marching formation.

As the sun dipped slightly westward, a huge mountainous mine finally came into view. A rough wooden fence loosely enclosed, separating the copper veins from the rest of the mine. Gilded copper ore painted streaks on the ground, piles of soil and stone built up into small mounds, and rudimentary furnaces emitted black smoke.

Groups of miners, dressed plainly, bent and gaunt, bowed their heads and carried baskets, bustling both inside and outside the mine, numbering over a thousand. Meanwhile, stationed at key traffic points and highland, were groups of Mexica Samurai. Armored and shielded, some even holding longbows, they closely monitored the operation of the mine. As the most crucial copper mine of the Fief, the site hosted an entire large unit, two hundred elite Samurai.

Seeing the approach of the Royal Banner from afar, a fully-equipped unit captain of the Samurai sprinted out from the mine. Approaching the King, he revealed a fierce yet familiar face and knelt down like a mountain.

"Your Highness, I salute you! I am the Divine Eagle's feathers, following you to the ends of the earth!"

Chapter 542 - Mine Inspection, Mining Industry in the Classical Period

"Haha, Necali, my formidable warrior!"

Xiulote chuckled. He stepped forward, cradling the arm of the Warrior Captain, motioning him to rise.

"You have been in charge of the Main Copper Mine in Qinganbate for four months now. How are things at the mine?"

"Your Highness, the Main Copper Mine is operating normally. We have five large squads of miners, just over a thousand. One large squad of warriors, two hundred strong!"

Necali stood up and responded loudly, as if he were being inspected by the Marshal in the army. He continued with a respectful and detailed report.

"In the late stages of the western campaign, the Qinganbate copper mine fell into chaos. The Tarasco warriors guarding the mine were drawn to the front lines, and most of the old miners fled. The mine area began to recover after the victory of the western campaign, with the assistance of the Head Eagle Warrior. New miners were continuously conscripted from various places... July and August are the peak of the rainy season. The heavy rain halted work at the mine for more than two months, and it was not until mid-September that mining officially resumed. There is a small furnace for smelting ore at the mine, and a new batch of copper material has already been smelted, ready to be transported to the Capital City..."

Xiulote stepped forward, listening to the Warrior Captain's report as he strode towards the center of the mine. The Head Warrior quietly issued a few orders, and thousands of trusted aides also split into two

teams. Half of them stayed outside, occupying high positions to scout, focusing on guarding against the south. The other half, gripping their weapons with stern expressions, followed the figure of the King.

In the solemn footsteps of the trusted aides, the profound and splendid Royal Banner of the Black Wolf was also erected at a high point in the mining encampment. The guarding warriors shouted harshly, and over a thousand miners knelt down like a swarm of busy ants. They bowed their heads deeply, pressing them against the cold, muddy ground, daring not to make a sound or to steal a glance at the King's face, but silently awaiting his commands.

"Hmm, numb expressions, eyes filled with fear, obedience is good..."

Xiulote observed the miners' behavior for a while, then waved his hand.

&"Let them continue their work, don't delay production."

Upon hearing this, the Warrior Captain became fiercely animated, bellowing out.

"The Supreme King has descended upon the mine! Everyone, put your spirits into it, get back to work! Whoever fails to meet today's quota will be hanged from the railing, every last one of you!"

The miners voiced their fear softly, like bees receiving orders. Quickly, they bowed their heads again and silently busied themselves.

Xiulote looked around and saw the so-called railings. It was a high hill lined with several meters-long wooden poles, from which several heads hung. The autumn in the Highland was still hot, and the heads had already rotted beyond recognition. Swarms of flies hovered around the heads, and a subtle odor, carried by the wind, spread a silent intimidation.

"Your Highness, these are the mining leaders who first caused trouble and were reluctant to go into the mines when work resumed! There are also some conscripted miners who wanted to escape at night... I captured them all that day and beheaded them in front of the miners!"

Necali raised his head, proud of his decisive actions before the King.

"This group of miners was rebellious, just about to cause trouble, but I easily suppressed them! I caught the ringleaders, and after having chopped off a few, the others became much more compliant. We, the Mexica warriors, have emerged from mountains of corpses and seas of blood; there's no room for these lowly miners to act unruly! Going into the mine might be dangerous, but they need to obey, even if it means dying down there!..."

Xiulote looked on for a moment, expressionless, then nodded slightly.

Mining has always been considered a perilous endeavor in any era. In this era shrouded in myths and ignorance, it was even more so. People generally believed that the underground was the realm of the deceased, harboring irresistible dangers and offending the majesty of deities. Entering the mines was like setting sail at sea, a profession only undertaken out of necessity, with no secure or long-term future. The miners held a very low social status and found it difficult to marry and raise a family.

After the western campaign, the nobility in various places had been wiped out, leaving vast fields unattended and many villages with young widows. Miners, claiming to be refugees, could join in the

communal farming in villages, happily marry, and lead long, secure lives. Without violent coercion and constraint, few miners would willingly stay at the mine.

This group of skilled miners was conscripted thanks to the strict military management of the Lake Region. They were identified by savvy village elders, then reported to the main priests and subsequently escorted here by the Militia Captains.

The King pondered for a moment before speaking slowly.

"Necali, forced restraint is indeed essential, but we can't rely only on that. Even when a Jaguar hunts deer, it leaves survivors. Regarding the treatment of the miners, it can be appropriately improved."

"As you command, Your Highness."

The Warrior Captain immediately bowed to take his orders. Then, he smiled and said.

"Your Highness, our army's veterans all know of your renowned benevolence, and we all regard you as our towering mountain! After executing the miner leaders, I specially distributed the warriors' liquor to comfort these miners. Their meals are also well taken care of; you can rest assured, Your Highness!"

"Very good! I will allocate sufficient liquor for you. Necali, I have valued your abilities since you captured the gates of the Capital City with your quick thinking, and I hold high expectations for you! Managing the copper mines is a matter of great importance for the fief, and I am confident in your handling of it!"

Xiulote nodded with a smile, affectionately patting the other's shoulder.

Chapter 543 - Mine Inspection, The Mining Industry in the Classical Period_2

The miners of this era were exceptionally toil-worn and endured great hardship, constantly living in danger. They were well-organized, able to evade surveillance in the underground mines, secretly collude, and with bronze mining picks in hand, it was easy for them to riot. They were the most dangerous class of civilians, requiring equally robust managers to oversee them.

Necali, a veteran scout and martial artist, had survived the brutal duels at the forefront of battle and was also fluent in Prepetcha. His methods were flexible and decisive, able to command respect from the samurai he led and suppress riots quickly.

Xiulote had taken note of his past performances and appointed him as the head of the mine. Now it seemed, the choice was most appropriate!

With this thought, the King's smile grew warmer.

"Necali, my samurai, have you grown accustomed to living at the mine? If there is anything you need for your life, you can tell me directly, or ask the logistics official who transports the supplies!"

"Ah, Your Highness... A samurai must restrain his desires and hone his body. I don't really have any needs for life, but there is one thought in my heart..."

The Warrior Captain's expression shifted. He hesitated for a moment, then, seeing the encouraging smile of His Highness, carefully switched to a more intimate address.

"Marshal, I am an old soldier who has followed you in battle for many years, a senior samurai who has risen through the ranks with each enemy head taken, never having handled a copper pickaxe... I wish to return to the legion, to be part of the campaigns of our fief, continuing to fight for you on the battlefield!... This dreary work of guarding the mine is truly numbing, to the point of developing sores on my behind..."

"Haha!"

Hearing Necali's request, Xiulote could not help but chuckle. He thought for a while, then straightened his expression and instructed.

"Necali, the western campaign has just ceased not long ago, and our fief needs time to recuperate and replenish. There are no significant battles forthcoming. Even if we were to send troops to the border, it would mostly be for capturing prisoners to replenish our fief's population. Time would be spent marching and escorting prisoners, hardly an interesting affair."

"My samurai, copper mining is the foundation on which our fief stands, and this mining area is crucial! My visit this time is to inspect on-site and expand the scale of mining operations. Soon, the number of people in the mining area and the output will far exceed the peak of the Tarasco Kingdom's prime!... Necali, you bear a heavy burden!"

The King eased his tone, smiling as he spoke.

"Of course, I have not overlooked your contributions and have plans to make great use of you. As long as you do well, I will entrust you with the entire mining area, over a dozen mines, to be the chief in charge!"

"As you command, Marshal!"

Upon hearing the words "great use," Necali's spirits lifted, and he replied loudly. Then, somewhat dejectedly, he muttered under his breath.

"Chief in charge of the mining area? Isn't that just overseeing mining..."

"Hmm?"

"I will not disappoint your expectations, Marshal!"

Necali immediately shouted out loudly, striving to be enthusiastic.

The Head Warrior shook his head slightly. He knew the high regard in which the copper mining area was held in the heart of His Highness, and the scale to which the mining area was planned to reach. As the chief in charge, Necali was, in fact, being promised a future equivalent to that of a Legion Commander.

"What a lucky fellow..."

Bertade thought and smiled, but he did not speak for His Highness.

The King simply reached out, solemnly ruffled Necali's hair, and spoke again with seriousness.

"Necali, explain the specific situation of the mine, so I can see how well you grasp the affairs here!"

"As you command, Marshal!"

Necali bowed his head in salute, stood straight, and replied loudly.

"The Qinganbate copper mining district is located 100 leagues southwest of the Capital City, slightly south of 60 leagues west of Patzcuaro City, and 40 leagues southwest of Ihuatzio City. This main mining field is by a mountain river. The entire mining district is surrounded by mountainous terrain within a fifty-league radius, making military advancement slow and supply routes challenging. Bulk transportation relies only on a narrow river..."

Drawing on his scout's experience, Necali continued his description.

"The main ores in the mining district are copper ores with jaguar spots, found both on the surface and underground. The surface ores at the main field have been largely mined by the Prepetcha, and there is still some left at several smaller mines nearby. Based on the mining reports these days, the underground ore has higher quality, and the resulting copper smelted is also greater in quantity!..."

Hearing this, Xiulote nodded, his thoughts wandering afar.

The Qinganbate mining district was a large porphyry copper mine that continued to be mined into later generations. The surface copper belts alone had reserves in the order of tens of millions of tons, while the deeper layers were difficult to estimate. Further down, there were enormous extending ore layers with substantial associated gold and silver. However, in Central America, where gold and silver mines were not scarce, these gold and silver values associated with copper had yet to be seen as worth mining. This was because within the Alliance's territory, there were plenty of easily mined gold and silver rich mines.

The King listened to the report, but his gaze moved to the bustling miners not far away. He saw over a hundred people lighting fires, scorching the copper-containing rock face. Several hundred others were about to enter the mine shafts, each looking grey and fearful, as if headed into a terrifying Abyss.

"What are they doing?"

Xiulote pointed to the miners burning fires and asked.

"Marshal, they are using a traditional method to shatter the rock wall. First, they burn the rock wall red-hot with fire, then douse it with cold water from a small pond of mountain spring. This evokes a conflict between the Fire God and Water Serpent, shattering the tough rock layers in their divine clash, and then extracting the copper-containing stones!"

"Heating with fire and dousing with water, hmm, this is using thermal expansion and contraction to fracture the rock layers."

Xiulote thought briefly, then pointed toward a nearby mine shaft.

"How deep is the underground excavation? And how long?"

Chapter 544 - Mine Inspection, The Mining Industry in the Classical Period_3

"The deepest part of the mine is about twenty meters, but the main areas are around ten meters. As for the length, it's hard to calculate, probably more than a li? Myths tell of great dangers lurking deep underground, home to demons and specters. When these evil creatures attack, torches and oil lamps would inexplicably extinguish, plunging everything into darkness. Miners would then, in the dark, have their vitality drained, their complexions flushing cherry red, and they'd inexplicably collapse dead without a single wound. Even if they were fortunate enough to be rescued, the ebbing of their life force would leave them insane or demented."

"Digging further could easily anger the Earth Mother Goddess, bringing tremors and collapses. Therefore, the miners never dared to dig too deep, afraid to disturb the demons suppressed beneath the earth, or incur the wrath of the Mother Goddess's majesty..."

At this point, Necali's face showed deep reverence. This seasoned Samurai, unfazed by death on the battlefield, and who could slaughter men as if mowing grass, was careful and retreating before the unknown powers of myth.

Xiulote remained impassive, gently shaking his head. He thought carefully about the details in the Warrior Captain's account.

"Flames going out without reason, cherry-red complexions, collapsing dead... that's a lack of oxygen and carbon monoxide poisoning, indicating a need to address ventilation issues. Tremors and collapses... therefore, deeper passageways would also need wooden supports for reinforcement."

As Xiulote pondered this, he saw another group of miners emerge from the ground. They walked silently to the edge of a small pond, expressionless and mute, with clay jars on their backs, only to pour out water with a "splash" sound.

"Huh? The clay jar is full of water?"

"Yes, Marshal. This is to drain water from the mines. During the rainy season, with too much ingress, draining is a daily task and requires the most manpower. Sometimes, draining is the only work available during the rains. You see, there's a shallow channel in the mountain spring's pond, from which the overflowing water is led to a little river, eventually reaching the lowest ground at Lake Zirahuen..."

At this, Xiulote was somewhat astonished.

"It is indeed dangerous when the mine is flooded. But does drainage require so many people?"

"Yes, Marshal. Today, thirty percent of the workforce is draining. When it rains, the number is even higher. Drainage is the most critical task in mining; only after water is sufficiently drained can the miners begin to excavate!"

Xiulote thought for a moment, then patiently asked,

"How exactly are the miners arranged? And what is the daily productivity of copper?"

The Warrior Captain thought for a moment, counting on his fingers.

"Two hundred Samurai form one unit, and there are five units of a thousand miners each. Of these units, one unit of 200 is responsible for logistics, including tasks like lumbering, charcoal burning, fire making, cooking, and other miscellaneous chores."

"One unit of 200 is in charge of copper ore selection and smelting. They start by busying themselves in the river, using wooden sluices to wash the ores and sift through for quality pieces. Then they crush the pieces of ore, the smaller the better generally. Lastly, they put them in small clay kilns with airholes and use charcoal to smother and heat them. When the fire is out, they cool the ashes with water, resulting in ochre copper suitable for direct forging into utensils for the Capital City."

"Good! You've been very attentive!"

Xiulote smiled in approval, expressing satisfaction with Necali. The Warrior Captain racked his brains, continuing to recall.

"Then, a unit and a half, or 300 people, carry clay jars in and out of the mine to continuously drain it. When they're about done, the last one and a half units of 300 enter the mine with bamboo baskets, using Bronze Pickaxes to chisel the hard rock walls and extract the blue-green Copper Ore. This work is quite tough and very dangerous; miners take turns doing it..."

The King nodded patiently, listening to the end. Necali clenched his fist tightly, smacking it proudly against his chest and declared,

"Marshal, on average, 300 people excavate, each expected to mine 20 jin per day, resulting in 12 jin of copper after smelting. With 1,000 miners in the mine, that's a daily production of 3,600 jin of copper!"

Chapter 545 - Mine Improvement, Guidance of Divine Revelation

"A daily output of 3,600 catties?"

Xiulote suddenly turned pale. He looked at Necali with some shock. As the main copper-mining area in the fief, the daily output of 1,000 miners was merely 3,600 catties of copper, and only 30% of them could actually participate in excavation. This production efficiency was far below his expectations. After all, the copper produced here not only supplied the entire fief but also nearly half of the world!

Seeing the king's shock, Necali wore a proud expression.

"Yes, Marshal. Under my management, the miners spare no effort and exert their utmost strength! The mining volume per worker has reached the highest level of the Tarasco Kingdom in the past decade!"

Hearing this, Xiulote turned to look at Ezpan, who had always been following at his side but seldom spoke.

"Your Highness, the person in charge of the mine has done an excellent job managing it. This output is indeed very high," Ezpan said with emotion, recalling memories from the past. He had stayed in these mines for a very long time, and many things were deeply ingrained in his brain like instincts.

"In this mining area, it's impossible to excavate during the peak of the rainy season in July and August. A large amount of rainfall in June and September requires at least half of the people to drain water, while April, May, October, and November's drainage accounts for at least a third of the workforce. Only during the dry season in December, January, February, and March can full-force excavation take place, and it

also has to contend with underground springs. At that time, the output should be around 6,000 catties of copper per day for a thousand workers at its highest. However, averaging out the rainy and dry seasons over the year, it basically stands at about 4,000 catties per day for a thousand workers."

Xiulote didn't speak. He slightly lowered his gaze, recalling the mining efficiency in modern Europe, and felt immediately dissatisfied.

"How could the output be so meager? Why is the efficiency so low!"

In fact, this was actually a misunderstanding on Xiulote's part. Mining is a team activity that requires a high level of coordination, as well as substantial technical and management skills. Excavating hard copper ore is also more time-consuming and labor-intensive than mining coal. In the Classical Period, lacking machinery, the actual number of workers who could participate in excavation was usually less than half of the total number of miners.

Even in the Ming and Qing dynasties of the Celestial Empire, despite having quality iron tools and mature technology, the daily output of a miner was only about 20-30 catties of copper ore. Of course, this was also because the copper mines in Yunnan were mostly poor and difficult to exploit, and the ore quality was relatively low.

In fact, of the world's top ten copper mines, eight are located on the American west of the Pacific Rim, with six in South America's Chile and Peru alone. Compared with these, the reserves and quality of copper ore in the Celestial Empire are so inadequate that they're enough to bring tears to the cash-strapped emperors.

Xiulote looked solemn and remained silent, causing the surroundings to fall still. He looked up at the sky, carefully contemplating the movies and written materials from his memories, determined to make

improvements to the mining facility's production equipment. After a moment, he reached out his hand, and the Head Warrior understood and brought him paper and pencil.

Necali stood respectfully by the side, eyes widened in awe, watching the "Divine Revelation" of His Highness.

"First is a straight shaft down, then depending on the direction of the rock layers, extend sloping shafts and horizontal galleries at different heights. At regular intervals, or in unstable rock layers, construct wooden frames to ensure the stability of the mine structure. The wooden frames should be connected by tenons, sometimes nailing the tips into the rock wall..."

Xiulote first sketched out a simple mining shaft, then emphasized the support structure of the wooden frames. Thinking of the underground caves he had visited, he again stressed.

"The reinforced wooden frames must be uniform and orderly. It is essential to nail the frames into the rock wall in the sloping shafts to prevent slipping. And in the fragmented ore zone, where rocks frequently fall, the frames must remain enclosed..."

Looking at the drawings, Necali nodded blankly, clearly not understanding.

Seeing this, the king pondered for a while then spoke earnestly.

"My warrior, these drawings contain the wisdom of the gods! The God of Flora is the child of the Earth Mother Goddess, bearing Her mercy and also blessing the lives of miners. Wooden frames can stabilize the world underground and are the most fundamental basis of excavation. You must construct the support structures seriously, just like building altars, ensuring the sturdiness!"

The Warrior Captain then became solemn, firmly promising.

"By your command, Marshal! You are the Priest of Divine Revelation, and I will do as you say!"

Xiulote gave a faint smile. He then drew a vertical ventilation shaft above the extended horizontal galleries.

"Only Tlaloc, the powerful Wind God, can overcome the evil beneath the earth and bring vitality to the underground mines... As the mining tunnels extend, there must be a vertical shaft from the surface for the force of the Wind God to enter. Multiple ventilation shafts can be excavated at different heights, forming convection under varying air pressures. Alternatively, torches, charcoal, and offerings of flora can be lit below the ventilation shaft to artificially heat the air below, creating convection..."

"What, you ask what convection is? Convection is the wind that connects the underground with the surface; it is the flow of Divine Power, bringing the vitality of the surface to the underground..."

After thinking for a while, Xiulote drew another mining air blower, similar to those used in iron smelting but slightly larger.

"In places where it's difficult to dig ventilation shafts, this can be used to pump air in... to introduce the force of the Wind God, though it will require some manpower."

Necali nodded vigorously, engraving this mysterious knowledge into his brain as if it was dogma to be followed.

"Next is the improvement of lighting. Each group of miners must have people wearing specialized wooden helmets, with hanging half-open ceramic oil lamps. This is to pray for the gaze of the Chief Divine to bless the work of the miners, so they do not fear. If the oil lamp quickly dims or goes out, it signifies that evil lurks ahead. They must retreat immediately and then pump the force of the Wind God ahead..."

Chapter 546 - Mine Improvement, Guidance of Divine Revelation_2

"At your command, Marshal! But with so many religious rituals, perhaps it would be good to arrange for two Priests at the mine? The miners likely don't have the ability to communicate with the spirits."

Hearing this, Xiulote's expression shifted as he laughed and said.

"Good! I will send several Priests there to oversee these important ceremonies. The miners are numerous, and indeed need Priests to guide their faith and soothe their spirits. With the Priests' prayers, the miners will better overcome their fear of descending into the mines. Sometimes, what truly frightens you is nothing but fear itself..."

"Next, we need to construct labour-saving lifting systems at regular intervals in the mineshaft. Relying solely on miners to carry the ores is both slow and inefficient. A great deal of manpower is wasted in transportation."

As Xiulote spoke, he drew a picture of a water-drawing windlass.

"Build a windlass in the mine for transportation from below to above. The current mine depths of more than ten meters can be managed with a single windlass. As the mineshaft becomes deeper and longer, we will need to construct tiered windlasses, carrying the ores up level by level, to save manpower to the greatest extent."

Necali showed an expression of sudden understanding upon seeing this. He was of course familiar with the effort-saving nature of the windlass.

"Lastly, and most importantly, improvements must be made to the drainage system. Remember, balance the power of the gods of wind and rain, expel the moisture, and transform it into wind. The windlasses responsible for lifting the ores can also be fitted with water buckets for pumping water. In places where water accumulates in the mine, additional drainage wells can be constructed. Of course, I have another effective drainage tool for you..."

At this point, Xiulote paused. He recalled the hand-operated reciprocating pumps from future rural areas, also known as simple manual pumps or hand pumps. The principle of such a device is the reciprocating movement of the piston, which creates a vacuum to draw water, and then pushes it out from the outlet at the top. Applying the principle of the pump and using bamboo to make a similar water drawing device resulted in the "Bamboo Dragon."

Necali perked up and watched carefully. He observed as His Highness drew an irregular bamboo tube with an opening on one side at the top. Then he drew a fitting movable stick inside the bamboo tube, and finally, he sketched an odd hand crank. The entire drawing was primitive and abstract, like a sacred and mysterious Priestly symbol.

"It's roughly this shape."

Xiulote looked at his rough sketch and pursed his lips; his drawing skills certainly needed improvement.

"The nesting bamboo tube should be easy to make; the effort-saving hand crank is not necessary. The operation is very simple, just a push and a pull to draw the water. If there are any damages or leaks, they can be patched up with rubber from a soccer ball..."

"That's all, reinforcement, ventilation, lighting, lifting, drainage, these five tasks—carry them out as I have instructed! Necali, there will be Priests to help you calm the people. What you need to do is improve the facilities and equipment, mine the rich veins deep underground, and strive to increase productivity! I'll set a small goal for you, raise the average monthly output by half, to 6000 catties for a thousand people!"

"Ah, 6000 catties for a thousand people?... At your command, Marshal! Following your will, I am willing to give my life for you!"

Necali accepted the order loudly, bowing to the ground, as if he were receiving military orders on the battlefield.

Xiulote nodded in satisfaction and extended his hand to stroke the other's hair again. The advantage of using loyal officers as managers was their ability to follow superior orders without hesitation. Their downside was a lack of specialized expertise and difficulty in independent thought.

"Hmm, upon return, I must summon Chalape to send two mining experts from the Metal Family to assist."

Xiulote's mind raced as he looked towards the Head Warrior again. The mine's facilities needed improvements, and the scale of the mining operations also had to be expanded further.

"Bertade, how many strong labourers can be supplied by the nearby villages?"

Bertade fell into thought; there were so many villages in the Lake Region that he could not recall at the moment. He fetched a rolled up atlas he carried with him, flipping through it as he read.

"Your Highness, within a radius of over twenty miles, there are seven to eight civilian settlements with a total population of more than fifteen thousand. If the autumn tribute from the villages is transported to the mining site nearby, it can supply three to four thousand able-bodied laborers. The mountain roads over this distance are rough, and we'll also need to conscript laborers from the villages to transport the grain."

Xiulote pondered for a moment before giving his orders.

"Conscript the tribute tax and labor from nearby villages to support the Qinganbate mining operation! Liaise with village Priests and reduce some of the tribute. Also, draw two thousand from the rested troops of the Surrendered Army from the southern route to rush to the mining area. By the end of October, the mine should have three thousand workers digging, and by the end of December, the production of copper materials in the mining area needs to be tripled... Necali, do you have the confidence?"

"By your command, Marshal! The capacity of the main mine is limited, improvements are needed, and there are several smaller mines around, all of which I will develop!"

Necali responded loudly, then, whispering, said,

"Marshal, mining has always been seen as a perilous profession, and miners are very lowly regarded. The Surrendered Army soldiers have wielded weapons, formed ranks, and some even have blood on their hands. Forcing them into mining might be difficult to manage. These people not only pose a risk of rebellion but also have the capability...could they be replaced with more easily commanded slaves?"

Hearing this, Xiulote thought for a moment and then shook his head.

"Necali, you are right, but the people of the Fief have already established settlements, I don't have any slaves to give you. Hmm, there will be Alliance officers and Priests in the Surrendered Army to help pacify them... wait a few more months, when the legions are dispatched, the captured Canine Descendants from the north will all be sent here!"

The King thought again about the organizational level of the Surrendered Army, which might also include some skilled Samurai, indeed a significant risk.

"Here's what we'll do, I will give you two more squadrons, four hundred Samurai! Six hundred Samurai to oversee three thousand miners, which is just the limit that nearby villages can supply... Necali, do well! From today, I promote you to Warrior Camp Chief, and all these people will be under your command!"

"Thank you, Marshal! I am honored to be your wings!..."

Necali was overjoyed and once again prostrated himself to accept the command. The King also revealed a smile. The two of them as if in agreement, finalized the rules and requirements for the mining camp.

The sun was setting in the west, leaving golden-red afterglow upon the undulating mountains. Wispy smoke rose from the mountains, faintly intertwining with the crimson afterglow, like ribbons of dancing spirits. Unknowingly, it was already time for dinner.

Bertade had no time to admire the magnificent sunset scenery. He was vigilantly watching the gathering miners who were starting to make fires and prepare their meal. Soon, thick cooking smoke rose from a corner of the rear camp. The smoke was dense, as if they were preparing meals for three to four thousand people, according to Samurais' common sense.

The Head Warrior furrowed his brow. He informed his Highness with a word and then drew his War Club, leading more than ten trusted aides to investigate. Over a hundred Cooks were busy in the rear camp, preparing fragrant corn cakes for the Samurai and enough grains for the miners. A few guarding Samurais were also supervising by the side.

Bertade did a brief inspection. To ensure safety, His Highness's food was all brought from the Royal Palace by the trusted aides, and these cakes were mainly provided to some of the accompanying Personal Army. He watched for a moment, nodded his head, and then his attention was caught by the cooking stoves.

"You there, what is this?"

The Head Warrior asked with some curiosity. Under the stove was not burning firewood but black stones, and the flames were vigorous, producing particularly heavy smoke. The Cook in front of him was continuously adding this kind of fuel.

Facing the question, the Cook stepped back, bowing reverently to the ground. The flames from the Black Stone rose with thick smoke, which already blackened his face.

"Great Master, this is what we dug up... the solidified blood of Demons from underground, containing the 'dead fire' of the Underworld... Though seen as unclean by the Priests, it still burns... Great Master."

Hearing this, Bertade took a piece of Black Stone and examined it closely in his hand. The stone was somewhat soft, and when slightly squeezed, pieces crumbled off. His hand quickly became stained black by the Black Stone. The Head Warrior frowned and, holding the Black Stone, went to the King touched by Divine Revelation.

Chapter 547 - Black Stone Myth, Primitive Coking!

"This is... high-quality bituminous coal?!"

Xiulote, holding the asphalt-like black stone in his hand and looking at the thick smoke from the burning black stone nearby, cried out in surprise.

A gust of wind blew by, dispersing the smoke and the cry in the air. The wind also brought with it the sulfur smell unique to mining areas and blew away the coal fragments in the king's hand.

The king seemed transfixed as he gazed upon it. They appeared to be the initial seeds, containing the faint signs of life for an industry's inception.

"Bertade, you have made a great contribution!... Where did you find this?"

"From the camp's kitchen. The miners unearthed this kind of black stone from underground to use for cooking fires, and it seems they have been doing so for quite some time."

Bertade smiled faintly. He understood his Highness very well and had known the prince would certainly be interested in such peculiar items.

"Ezpan, have you seen this before?"

Xiulote turned to Ezpan, who came from a mining background. Looking apprehensively at the black stone in the king's hand, Ezpan answered in a low voice.

"Your Highness, this is the blood of demons that coexists with the Stone of the Dead. It is said that in the legends, the great Divine Descendants slew and suppressed many underground demons. These demons, hailing from the dark Abyss, turned into black rocks of blood and flesh upon death. The mine has secretly used the black stone as fuel for over a decade now, at least since the first time I worked as a miner. This stuff burns for a long time and with great heat, saving much effort needed to chop wood."

"How abundant is the black stone?"

"Not too little, seemingly inexhaustible. There are two deposits near the Main Copper Mine, and some can also be mined underground."

"If there is so much of this black stone, why have I never seen it in the Capital City?"

Hearing this, Xiulote felt both invigorated and puzzled. In this era, chopping wood was an extremely time-consuming and labor-intensive task. After chopping the wood, one still needed to wait for it to dry

before it could be burned, and even then, the heat value was not high. In contrast, coal was easy to mine and lasted long when burned, clearly superior to wood.

"Your Highness, because it is the unclean blood of demons!"

Ezpan was surprised at the king's nonchalance.

"Some miners once brought black stone to the priests in Tarasco, hoping for a reward. The priests, however, were infuriated, deeming it evil and immensely unclean. They said that if the flame of the Stone of the Dead could communicate with the world of the dead, then naturally the burning of demon blood could also connect with demons... It is a highly dangerous evil object that should not be casually handled by commoners."

Xiulote paused, finding the deduction somewhat consistent with theology. He asked curiously.

"And then what happened?"

"And then... the miner was executed. The priests also sent people to the mine to identify the evil, and many of the older miners who had used the black stone were also put to death. Fortunately, I had only just arrived at the mine and they needed to keep people for mining operations, so I escaped that fate... After that, no one dared to talk about it in public."

"Mining is really hard work, and there's always too much to do. By burning black stone, a lot of manpower is saved, allowing the mines to meet production requirements. The Tarasco samurai overseeing the work turned a blind eye, letting the lowly miners use the unclean black stone. They themselves would never touch it..."

"...I see... Advanced production methods that challenged divine authority were suppressed, yet preserved in secret because of their advanced nature..."

After listening to all this, Xiulote shook his head, filled with emotion. The issue couldn't be simply attributed to the conservative ignorance of the mythological era. As a High Priest himself, he could better understand the logic behind the actions of the Tarasco priests.

The divine authority of the priests did not come from force but from the awe of the hearts of the people. The Tarasco priests burned the Stone of the Dead to communicate with the deceased, deterring the masses and sustaining their authoritative divine power. This majesty would not tolerate challenges from ordinary civilians; burning "magical items" naturally remained a privilege reserved for priests alone. The demon blood was closely related to the Stone of the Dead in mythology, so it could not be discovered by lowly miners, nor could the common people use it at will!

"Divine authority serves the priests. The root of this misfortune lies in the identity of the discoverer! If a High Priest had discovered coal and put a different spin on it, the outcome would've been completely different."

Xiulote mused. As he delved deeper into governance, he increasingly felt that the struggle for power and identity and the suppression of traditional authority were omnipresent in the operation of the Kingdom. How to continuously balance tradition and innovation, to provide growth space for new forces while maintaining the stability of the Kingdom, would become his lifelong exploration and reflection!

The discovery of coal disrupted the original plans. Xiulote postponed the subsequent farm inspections and focused entirely on investigating the "food of industry," also considering the use of coal.

The Black Wolf's Royal Banner remained stationed in the mining area, envoys sent to support were dispatched back to the Capital City, and new Royal Decrees were issued. Guided by experienced miners, squads of samurai set out in all directions to collect all the special rocks, including samples of the black stone, to search for "where the demons were suppressed."

In the Main Copper Mine amidst the mountains, mining by the workers continued. The king did not interfere much with the mine's operations, nor did he care about the rudimentary living conditions. He simply collected all the coal from the mining area under the anxious eyes of the miners, and then began to attempt to refine coke using the crude methods he remembered.

On the highlands of northern Jin in later times, crude coking was once very common. Xiulote had traveled there and seen the real thing, and also heard stories about coking from a tour guide. In general, crude coking was similar to charcoal burning in the sense that coal was ignited in a furnace where air was not completely sealed off, in order to achieve high-temperature dry distillation and carbonization. The kiln for crude coking could be designed like a clay brick kiln, with only slight modifications to its shape.

Xiulote assembled a dozen experienced miners, and after three to five days, they built a brick kiln furnace over 2 meters tall.

The kiln had more than a meter buried in the ground, and the top was shaped like an inverted pot, with a bottom diameter of about 3-4 meters. Overall, it somewhat resembled a Mongolian yurt. The furnace walls had vent holes for igniting and flue channels. The top of the kiln was tightly covered with clay, except for the chimney and ventilation holes.

While the kiln was being built, another group of miners crushed the coal and carefully sieved it to remove impurities. Once both sides were ready, they filled the furnace with the crushed coal and packed it tightly. Then they lit the coal through the ignition hole, beginning the coking process in the furnace.

Soon, the coal gradually heated and began to burn, emitting billowing hot air and thick smoke from the top flue. The smoke was intense, filled with both the pungent waste gases from the combustion of coal and a large amount of unpleasant coal decomposition products.

Xiulote stepped back a few paces, away from the range of the heatwave and smoke. He sniffed lightly and faintly detected a familiar, pungent odor.

"Hmm? This smell... ammonia?"

The thought momentarily carried the King's mind far away. An ancient term surfaced in his memory, prompting him to sigh lightly.

"Coal chemical industry..."

The smelting of the coal continued for a full ten days, and the thick smoke gradually became lighter and then disappeared. This indicated that the coal in the kiln was nearly done calcining, leaving behind a hard, porous coke.

Only then did Xiulote arrange for people to pour water onto the scorching hot kiln to extinguish it. Not until the kiln had cooled off did Ezpan personally move to unseal the furnace mouth and extract the epoch-making metallurgical fuel, coke!

"Your Highness, this is the Divine Object you received after the sacrificial rite! We thank the Chief Divine for his blessing, for purifying the demon's blood!"

Ezpan's expression flickered with excitement, shouting slogans of the divine. The surrounding miners all looked on with reverence, prostrating themselves in unison.

"The Chief Divine is omnipotent and incomparable to ordinary deities. His radiance shines upon the earth, cleansing the impurity in the Black Stone. As long as we pray to the Chief Divine, the commoners may use the Black Stone without fear of corruption! And when the Black Stone undergoes the ritual of calcination, it becomes a true Divine Object, imbued with the power to change the world!"

Clad in elaborate Ceremonial Dress, Xiulote recited in an archaic tone in front of all the samurai and miners. With irrefutable authority, he intended to redefine the mythical status of Black Stone.

In the midst of the King-Priest's chanting, everyone prostrated themselves together, facing the freshly coked kiln, praying loudly at this peculiar "altar."

"Praise the Chief Divine! He is all-powerful, bestowing upon us the Divine Object with His warm flames!..."

After the solemn prayer, Xiulote waved his hand, signaling the samurai and miners to resume their work. Then, struggling to contain his excitement, he picked up a piece of coke and examined it closely.

The piece of coke in his hand was irregularly shaped, with differently sized pores throughout, and was silvery-gray in color. With a slight grip, he could feel the unique hard texture of coke, completely different from the loose coal.

In this era, coke-making technology was only mastered by the Celestial Empire in the East. Although coking iron had appeared two hundred years prior, it had always been passed down among deeply established master craftsmen. This was the first coke production in the entire western hemisphere!

"Now that we have coke, all that's missing is iron!"

Xiulote felt a moment of sentiment, another seed he had sown by hand, slowly altering the entire era. After a while, the King waved his hand, and Ezpan, along with two samurai, began removing the formed coke, weighing it with a simple balance scale.

Ezpan quickly calculated the yield, which was about 40%. With increasing experience in coking, the yield would gradually improve, with the peak for primitive coking expected to reach 60%.

"Hmm, for a first-time coke production, the coal quality in the mine is quite high!..."

The King murmured softly to himself, then patiently waited. Groups of scouts gradually returned from all directions, bringing mineral reports from the mining area.

The Qinganbate mining area, located near a dormant volcano, contained a wealth of rich ore deposits. Dominated by copper, it was estimated to be over ten million tons. Following was the associated gold and silver ore, situated deeper and more troublesome to smelt, not currently worth exploiting. Next, the volcanic area's sulfur - the quantity was not clear, but definitely sufficient for use and was at one time secretly controlled by the priests.

And, surprisingly, a miner presented a piece of lead-zinc ore familiar to the Alliance. Given the geological features of the area, the lead ore should also contain silver.

"Hmm, lead-silver separation, the cupellation method..."

Not sure what he was thinking of, a smile appeared on Xiulote's face. He chuckled, shaking his head, and then inquired about the most important coal mines.

Within a twenty-mile radius of the mining area, they discovered five small coal mines with reserves of a million tons each. According to the miners, there were several more underground deposits of the "Demon stone." The total reserves were certainly more than twenty million tons, consisting mainly of bituminous and lignite coal.

By later standards, the coal reserves here were modest, their value nowhere near comparable to gold and silver mines. In later times, the Qinganbate mining area was monopolized by mining conglomerates. The Mexica Government, despite discovering coal mines, deemed them unworthy of exploitation, leaving only private teams to stealthily mine them.

In this era, however, such reserves were already sufficient in Xiulote's view.

"The Qinganbate mining area, with its copper, gold and silver, sulfur, coal, and lead-zinc mines... The fief's handcraft industry, gunpowder workshops, bronze workshops... The future industrial center of the fief should be established here, providing an unending force for the Kingdom's conquest!"

Xiulote lifted his head, gazing into the distant sky, his plans as broad as the heavens themselves. Eagles would soar through time, and the plains of the East, the hills of the South, the mountains of the West, and the Great Lake of the North, would all eventually fall under the King's purview!

Chapter 548 - Distant Future: Industrial Technology Planning, Divine Revelation Book!

The night was deep, and the distant mountains, like beasts lying in wait, disappeared under the pitch-black canopy of the sky. The moonlight was dim, and nearby, the mine shafts resembled roads of no return, leading into the dark depths of the earth. The era of myths lingered in people's hearts, making every natural scene brim with an unknown divinity.

Beneath the night moon, the mountainous region of Qinganbate was steeped in depth, with only a flickering bonfire in the main mining area. Loyal samurai patrolled through the night, gripping their weapons in solemn vigilance, safeguarding the Monarch's safety. At the heart of the samurai's tight security lay the mining area's only simple stone hut. From a distance, one could faintly see the light of fire flickering within.

The bonfire blazed, the old charcoal giving off blue smoke, while the newly made coke was bland and tasteless. The Head Warrior held his breath as if feigning sleep, guarding by the King's side. Inside the hut, there was silence, save for the scratching of a pen on paper.

Xiulote knelt in the hut, writing on the paper with a fine feather pen. After a while, he stopped his pen, looked at the burning fire, and smiled contentedly.

"This charcoal is of good quality, with few impurities and strong flames. It's a pity to use it just for firewood."

Bertade opened his eyes and saw His Highness's heartfelt smile, so he also smiled and asked,

"Your Highness, have you finished writing the 'Industrial Technology Planning Book' you mentioned?"

"Yes! The general framework is right here."

Xiulote smiled and nodded. During his days in the mining region, he had been contemplating subsequent plans. Many old memories were growing faint, needing careful writing to recollect and calculate. He took this opportunity to outline his thoughts on industrial technological development on paper as a long-term blueprint for the Kingdom's construction.

"Bertade, come over and take a look!"

The King waved, and the Head Warrior knelt closer, leaning in to listen.

"The eagle's gaze extends for miles, and the roots of the Divine Tree grow for a thousand years. All major events must start from the beginning to soar to the height of eagles, to support the stability of the Divine Tree!"

"Bertade, you are my most trusted confidant, having followed me for many years. Only you can roughly understand this plan, and it will help you in your future tasks. I've mentioned before my intention to have you take charge on your own..."

"You are to go to the distant Eastern Great Lake, take control of the long island in the lake, and establish a foothold there... The island will be rich in minerals, and they will be easy to mine in the open. It is a gift

from the Chief Divine to our Mexica people, also a crucial point for guarding the realm... The tasks you need to undertake will be numerous and difficult, with the danger to your life at all times!"

"Your Highness, even if the journey is fraught with peril and spans thousands of miles, I am willing to give my life for you! I will certainly stop... capture... kill!..."

Bertade's expression turned solemn, and he nodded earnestly. His Highness's Prophecy, though comprised of only a few sentences, had always stayed in his heart.

"Good! Bertade, don't worry. The previous few batches of foreigners were merely a few hundred people. They came thousands of miles by ship, without a foundation or stronghold, and are not yet a concern..."

Xiulote smiled with satisfaction, patted the Head Warrior's shoulder, and gave detailed instructions.

"...Your most important future task is to first consolidate the various factions on the island, second to prepare for terrible epidemics, third to build gun emplacements, and fourth is to smelt iron and steel!"

Bertade memorized every word, then asked with confusion,

"Smelt iron and steel? I recall Mayan merchants brought you iron, but what exactly is steel?"

"From iron ore, iron can be smelted, and steel is created through the proper treatment of iron! Steel is exceptionally hard, suitable for the finest weapons, and the toughest armor. More importantly, steel is the gateway to industrialization! And high furnace coke for iron smelting is the most important first step beneath that gateway!..."

Xiulote spoke while extending his hand toward the wide scroll spread out on the table.

The scroll had boxes with terms delineating different technological fields, separated by columns, and annotations mixing numbers, letters, equations, and text below the terms. Arrows pointed unidirectionally between the technical terms, indicating prerequisite technologies.

Bertade looked at the first column, where "Fuel" caught his eye. After "Fuel" came an odd "C," followed by "Wood," "Coal," "Petroleum," three baffling names. Under these names were small arrows, descriptions of different fuel states, possible discovery locations, and some inscrutable symbolic notations.

He looked past those difficult terms, straight to the locations. After coal was marked Qinganbate, small quantity; two thousand li north, vast quantity. Petroleum had notes: north-northeast, two to three thousand li.

Seeing these oracle-like descriptions, awe once again flickered in the eyes of the Head Warrior.

"Your Highness, is this?"

"These are all materials for burning! Fuel is the cornerstone of technology, as well as the food and blood of industry."

Xiulote chuckled. He didn't ask whether Bertade had understood, but instead began to explain in detail, while carefully organizing the connections in his mind.

"With a kiln, we can turn wood into charcoal, and coal into coke. Coke removes sulfur impurities and has a higher heat value, more suitable for smelting metals. During the coal coking process, a large number of by-products can be made, which is the most basic coal chemical industry... And in processing petroleum, many more valuable products can be obtained, called the petrochemical industry. Unfortunately, I probably won't see that in my lifetime..."

Xiulote moved his finger, pausing over "Coke Smelting," recalling the scent he had smelled during the day.

Chapter 549 - Distant Future: Industrial Technology Planning, Divine Revelation Book!_2

"The process of coke formation releases ammonia gas, which can be used to make important fertilizers, but it requires acid for absorption,"

The Head Warrior looked toward the corner at the "acid" section, where below were written "hydrochloric acid," "sulfuric acid," and "nitric acid." He recognized each word, but together, they were entirely confusing.

"The easiest acid to obtain is sulfuric acid. If you find sulfates, like green vitriol or gall vitriol, just use ceramic pots for dry distillation. If you can't find those, you can also use the lead chamber process. We already have sulfur and saltpetre, the combustion of the two produces a mixture of gases, which, through a corrosion-resistant lead chamber, oxidizes to form sulfuric acid... Well, that should roughly be the principle. There are also lead-zinc ores here, making lead quite easy to produce. If you don't care about purity and efficiency, you could try making some with primitive methods..."

Xiulote was lost in thought for a moment before he once again pointed to the word "fertilizer."

Bertade carefully observed and saw behind the fertilizer was "N, P, K," a group of mysterious symbols. Then further noted "guano," located at "the end of the Lerma River flowing into the Western Great Lake, two thousand miles north along the coast, on the dry islands of seabirds."

"By introducing ammonia gas into sulfuric acid, ammonium sulfate fertilizer can be obtained, effectively increasing the yield of the fields. This is the easiest nitrogen fertilizer to manufacture artificially. And ammonium nitrate, while also a fertilizer, is an extremely powerful explosive... Of course, given the difficulty of producing nitric acid, during my lifetime..."

Xiulote shook his head, glanced at the "explosives" column next to him. At the top naturally was "black gunpowder," followed by "nitroglycerin," and then "TNT." The latter two names were marked with question marks, the manufacturing processes unknown, but there was a small note: "The Divine has said, the more nitro groups, the greater the difficulty, the stronger the power!"

The King gave a faint smile and continued with the main topic.

"Bertade, look here,"

Upon hearing this, the Head Warrior looked and saw in the most conspicuous place in the middle, a column labeled "Metallurgy," followed by "Bronze smelting," "Iron smelting," "Steel smelting," interspersed with mysterious symbols like "Cu,Sn,Fe,C."

"Fief's metallurgy starts with bronze since the Alliance possesses both copper and tin ores. However, bronze inherently has flaws in ductility and both mining and smelting costs are higher,"

Xiulote paused for a moment, his finger lingering on "Iron smelting." The Head Warrior continued looking beyond, seeing locations tagged as "Colima, Southwestern Mountains," "Cuba, in the Eastern Lake, at the eastern end of the serpent-shaped Long Island," "North America, thousands of miles northward," suddenly realizing the implications.

"Copper mining operations will expand significantly. The Capital City's bronze smelting will also use coke, and the Kingdom's bronze production will soon vastly increase. Once bronze smelting develops, next will be iron smelting,"

"What can truly become widespread and completely change the world are iron tools! With coke, building blast furnaces, and blowing in air, it's possible to reach the high temperatures needed to melt iron; the technology prerequisites for mass-producing iron are already mature. It's just that iron ore is hard to find in this world. I have always been trying to find sources of iron ore,"

Xiulote sighed deeply. Colima's iron ore is deep, North America's iron ore is far. Cuban iron ore requires navigation. Among them, Cuban iron ore is an open-pit rich mine, its location can be definitively confirmed, taking advantage of its mining..." Thinking this, the King patted the Head Warrior's shoulder, before continuing.

"The iron produced is divided into raw and mature, corresponding to the high and low carbon content... Carbon is... well, the life force contained in the iron, it's a bit like bronze containing tin, high content makes it brittle, low content makes it soft. However, what's special is that if the carbon content is just right, it will be both hard and tough, known as steel!"

Xiulote's finger slid down from "Steel smelting," below which were "forging steel," "casting steel," "frying steel," "pig iron refining steel," each marked with different terms like carburizing, decarbonizing.

"Coke blast furnaces melting iron ore will produce pig iron. If pig iron is refined again, controlling the temperature and oxygen well, steel is directly obtained, called pig iron refining steel... Of course, this method, while seeming the simplest, is actually very difficult; there's no hope for decades,"

Xiulote smiled helplessly, his thoughts flying back from the distant industrial future, back to the present start from scratch.

"Forging steel is carburizing mature iron, a complex and effort-consuming process, also called 'hundred forging into steel.' Casting steel is putting pig iron and mature iron together, first melting the pig iron, infiltrating it into the mature iron, then blending and hammering it together. Frying steel is during blast furnace smelting of pig iron, as molten iron flows out, it is continuously stirred in the air while being heated for decarbonization, directly becoming steel."

"Actually, directly frying steel is still too difficult. Well, it might be better to fry pig iron into mature iron, then use either forging steel or casting steel method, time-consuming but a stable way to obtain steel!"

Thinking of this, Xiulote's eyes reflected a visionary look. Although these processes were only roughly sketched out, so long as continuous human and material resources were invested in experimentation, they would step by step, solidly march towards success.

"The greatest advantage of a transmigrator lies not in the specific technical level, but in pointing out the correct direction in the vast darkness!"

The King whispered softly, his confidence surging within his chest.

Bertade respectfully bowed his head, looking at the "Metallurgy" below. There, the words "metalworking" were written, followed by an incomprehensible row of single characters: "turning, milling, planing, grinding, boring, drilling, wire." These characters had no explanations, just added a "hydraulic forging hammer."

"Your Highness, what do these mean?"

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Xiulote's face stalled. He only had a vague memory of that mnemonic verse, and as for the specific metalworking machinery, it was naturally impossible for him to remember. The King simply pointed at the end and explained.

"Set up water wheels by the riverside, then connect them to forge hammers, and they can be used to forge metal armor plates or rough Armor casts. In addition, water mortars can process grains. Oh, right, there are also windmill gristmills..."

Xiulote added "windmill" under the "simple machinery" section next to him, which already had many jumping terms including "weaving loom," "spinning machine," "cotton gin," "semaphore tower"... Of course, in the King's mind, these machines were just nouns, with only a general idea of their functions. There was one exception... "steam engine"!

Xiulote's gaze lingered on the "steam engine" for a long time. Arrows led from both "metallurgy" and "metalworking" to it, silently telling of the technology's prerequisite challenges. However, the term "steam engine," as if possessed of a unique magic power, continuously captivated his thoughts.

"The dawn of the industrial revolution, the steam engine..."

Xiulote murmured to himself, struggling to recall the nearly forgotten textbooks. Those once-crystal-clear illustrations were now reduced to abstract and vague shapes.

"Cylinder, piston, valve timing, cold water condensation, the transmission of power via the rods..."

Vague shapes with clear principles transformed and combined in the King's mind, but unfortunately, they couldn't assemble the "complex" Watt steam engine. After a long while, Xiulote sighed softly. He picked up the pen and sketched a simple "Miner's Friend"—Safri's steam water pump.

"Although you could use bronze for cylinder and have vulcanized rubber for seals... but until metallurgy and metalworking technologies are sufficiently advanced, a practical and affordable steam engine is just wishful thinking, still a hope for a lifetime!"

Soon, Xiulote came to terms with reality, chuckling at himself. It was worth mentioning that for a transmigrator sealing a steam engine, the invaluable vulcanized rubber was readily available to him in America.

Rubber originated in America and had been widely used worldwide. The primitive vulcanized rubber was invented in the ancient Olmec period, and the Olmecs were thus called the Rubber People. They combined the boiled sap of rubber trees with the juice of American grapevines to produce the most primitive vulcanization of rubber and made it into waterproof rain gear. Such garments held unique religious significance; often worn for ceremonial ball games and accompanied by sacrificial rites for the losers.

Xiulote shook his head gently, writing down "vulcanized rubber" under the "Unclassified" section at the bottom. Vulcanized rubber could also be obtained by fumigating with sulfur. It was temperature resistant, waterproof, and not prone to stickiness or deformation, with high resistance to oxidation and

wear, suitable for making many practical tools, such as important tires, convenient rubber shoes, and raincoats.

In this section, there was also "glassmaking." The Stonemason Chief Losano's research into glass had been going on for two years with almost no progress. Now, with coke and blast furnaces, the difficulty of melting glass could be greatly reduced.

"Glass beads are the cheapest of monopoly trade goods..."

Xiulote smiled faintly. The broad scroll was nearing its end. Bertade looked down at the bottom, where there was one last section labeled "Future." Inside, it was filled with complex terms like "electricity," "telegraph," "internal combustion engine"...

"Your Highness, what are these?"

The King hesitated for a fleeting moment, then spoke gravely.

"These are the Chief Divine's ultimate guidance, and the future after my death."

At these words, Bertade fell silent for a moment. His eyes sparkled, and it took a while before he spoke softly.

"Your Highness, this scroll is so important, it should have a more fitting name."

"Oh?"

Xiulote was intrigued, a twinkle in his eye.

"What name?"

"Divine Revelation Book!"