

Civilization 255

Chapter 255 Black Gunpowder and Gunpowder Weapons

Xiulote's expression was serious as he gave the order. Everyone also straightened their faces and bowed respectfully. The workshop once again buzzed with activity.

The female workers obediently followed the command. They used mortars and pestles, carefully grinding the saltpetre, sulfur, and charcoal each into a fine powder, then placing the powders in the mortar in proportion. Each batch of powder measured 15 liang, 2 liang, 3 liang, totaling a bit more than one jin.

Next, Xiulote extended his hand, pulled Talaya to his side, and stepped back a few steps, signaling the women to continue. At the request of His Highness, they mixed all the ingredients with even greater care for a full quarter-hour before looking up at the young man.

Xiulote thought for a moment. He dimly remembered there was a very crucial step that could effectively improve the burning efficiency of the gunpowder. After pondering for a while without inspiration, he could only nod to let the workers begin the test.

Soon, the pottery jar was once again placed on the testing platform, containing the new formula of gunpowder weighing one jin and five liang. A few grass dummies were positioned at distances ranging from one meter to several meters away. A samurai took a torch from the workers' hands, lit a match cord a palm's length, and then, at the young lord's command, quickly retreated.

Xiulote grabbed Talaya's arm and stepped back a few more steps. The pottery girl winced slightly with the pain and was compliantly pulled back, leaning quietly against the boy's shoulder. Then, she turned her head to look at him, her eyes filled with puzzlement.

"Your Highness?..."

Xiulote's face was earnest as he focused intently on the pottery jar.

"Be careful, it will explode."

Talaya obediently nodded her head, also turning her gaze toward the pottery jar.

As the match cord burned rapidly, the gunpowder in the jar ignited instantly. Then, bright flames soared upwards, quickly reaching a height of two meters. Accompanied by billowing smoke, a warm wave of heat came forth. This time the combustion of the gunpowder was noticeably faster, and in just over a dozen breaths, the flames were extinguished, leaving the jar still intact.

Watching the splendid fireworks, the pottery girl's eyes widened as she took in the unforgettable beauty. Then, she turned her head towards the young man again, her eyes curved in a smile.

"Your Highness..."

Xiulote's face flushed with embarrassment. He thought about the speed of the burning and the warmth of the wave, then nodded affirmatively.

"Carefully cover it with the pottery lid, secure the match cord, and light it carefully! Everyone step back."

The test proceeded quickly once more. This time, as the match cord burned out, there was a slight silence before the firelight flared violently. With a loud bang, the pottery lid burst into pieces, and the jar shattered along with it, as a bright yellow flame erupted from the platform. Immediately after, suffocating smoke and another warm wave, along with flying pottery shards, hit them.

This colossal boom, like thunder tearing through the sky, struck deep into everyone's hearts and at the hurried steps of an age, pushing it toward a new and uncharted future!

Everyone was momentarily silenced. After a while, the women workers knelt down, praying towards the source of the great noise, occasionally looking towards His Highness with reverence. The samurai felt shaken, and when they looked towards His Highness again, their eyes carried divine respect. Bertade's face turned serious as he examined the pottery shards embedded in the grass dummies. The pottery girl's face was full of shock; after being dazed for a moment, she once again leaned tightly against the young man's shoulder.

Xiulote, too, gazed at the explosion of the gunpowder, marking Central America's first epochal moment! A joyful smile slowly spread across his face, his heart heaved with emotion, and a multitude of feelings surged within. Feeling the softness at his shoulder, he extended his arm and pulled Talaya into an embrace, hugging her tightly for the first time and whispering to himself.

"I know... I will change everything!"

The pottery girl murmured softly and leaned against the young man, her heart pounding fiercely, her body warm and weak, her eyes brimming with emotion.

After a moment of excitement, Xiulote let go of the girl in his arms and headed straight for the testing platform. He examined the power of the explosion in detail. The top part of the pottery lid had flown almost ten meters away, the jar had burst open, but the lower base remained intact, with some unburnt gunpowder powder inside.

On the closest dummy, at just one meter away, a few pieces of pottery shards were embedded, and the dummy itself was knocked askew by the blast wave. The grass dummy at two meters away was affected in the same manner. Beyond three meters, the dummies were almost undamaged. Observing the ground, the larger pottery pieces had traveled only four to five meters at most, and the smaller fragments, six to seven meters.

Xiulote fell into contemplation. The power of the black gunpowder before him was significantly less impressive compared to the common fireworks of later centuries, and roughly similar in potency to the gunpowder used in the European countries of this era.

At this time, on the Eurasian continent, the precise formula for black gunpowder had long been explored. The world's major powers were rapidly advancing the application of gunpowder, with matchlock guns and copper cannons already beginning to be equipped in armies for warfare. At the same time, Europe built many gunpowder schools in large numbers, improving the manufacturing techniques of gunpowder, with the research at the Tower of London enduring for one or two hundred years.

And decades ago, a significant step was added to the production of gunpowder by the Shenluo gunpowder craftsmen, henceforth greatly increasing the potency of gunpowder and allowing for long-distance transportation.

"What exactly is this step?" The young man was again troubled by this process. Then, he shook his head, considering the improvements that could be made.

The power of gunpowder lies in the purity of its ingredients. In the purification of saltpetre, Xiulote had already pointed out the potassium nitrate purification technique, involving repeated dissolution and the precipitation filtering of wood ash. As for the purification of sulfur, the young man only remembered it was related to the melting point, seemingly involving heating to vaporize and water-cooling to solidify, but the specific steps temporarily eluded him. Finally, it was using charcoal with a higher calorific value. The craftsmen of the Celestial Empire often used willow charcoal, but unfortunately, willows did not exist in Central America at this time, though it seemed that fir and pine could also suffice.

Observing and pondering, Xiulote sat down cross-legged again, with a preliminary formula for black gunpowder at hand, what weapons could be made?

Bertade made a gesture to the potter girl. Talaya blushed, brought pen, ink and paper, and again sat close to His Highness.

Xiulote's thoughts spanned centuries as he recalled the early gunpowder weapons that appeared in the history of the Celestial Empire. Any weapon requiring metal had to be abandoned, and the creation of weapons needed to be simple in craftsmanship, in line with the production level of the Alliance. Moments later, three names took shape in his mind.

The first to emerge was the fire arrow plan that had been devised long ago. In the young man's recollection, this weapon should have appeared first in the Northern Song Dynasty and then shone brightly during the battle of Tang Island in the Southern Song Dynasty, suitable for naval incendiary warfare.

The fire arrow with gunpowder was to tie a spherical, symmetrical gunpowder bag to the rear of the arrowhead, not affecting the balance of the arrow's flight. The gunpowder bag was made using slow-burning paper or cloth, pasted into a sturdy shell, filled with gunpowder. Then, in battle, the shell would be ignited with a fire cone and launched with a bow or crossbow.

Considering the drawing force of the longbow, the weight of the gunpowder bag should vary by several tens of grams, and could be increased for close-range shooting. The purpose of the fire arrow was to cause ignition, so the proportion of the less-abundant earth saltpetre could be appropriately reduced, with increased ratios of charcoal and sulfur. This would slow down the burning speed and extend the burning duration.

Xiulote nodded slightly. Gunpowder, paper, arrows, longbows—all these were within the production capability of the Alliance. He took the pen and paper and drew a longbow with fire arrows equipped with gunpowder bags at the center.

The second suitable weapon was ceramic caltrops, akin to the earliest hand grenades. This weapon appeared during the Song dynasties and had been extensively unearthed in the northern regions of the Celestial Empire, with usage seen among the Song, Liao, Jin, and Xia nations. It was a close-range thrown explosive weapon.

The ceramic caltrops featured either a ceramic or porcelain shell, round with a small mouth and a large belly. Filled with gunpowder inside, the exterior sported ceramic spines. After lighting the match cord, the caltrop would be thrown several to dozens of meters. Upon exploding, the caltrop spines could kill enemies within a few steps, while the noise could intimidate horses. Considering its historical impact, this weapon, like something out of mythology, was expected to have a stunning effect on the various parts of Mexico, beyond the actual power it possessed.

Based on the samurai's throwing capability and the explosive force of black gunpowder, the young man redesigned it. The weight of these ceramic caltrops should be like that of a lead ball, ceramic shell weighing two to three pounds, filled with three to four pounds of gunpowder, with a total weight of five to eight pounds. They would be thrown between ten to twenty steps, with the explosive force being within five to seven steps.

If used from a defended position or launched with a trebuchet, large ceramic caltrops could be made, or the ceramic shell could be replaced with a paper one, becoming the paper fireballs seen in the history of the Song Dynasty. By adjusting the ingredient ratios, the function of gunpowder weapons could range from explosions to fire-setting, creating smoke or dispersing poison.

Xiulote pondered briefly. Pottery was an expertise of the Alliance, and there were likewise many skilled workers... He then drew the design for the ceramic caltrops on paper. To Talaya, it looked like a large cactus spine ball.

The third chosen weapon was the wooden cannon. This weapon appeared during the Song Dynasty, but was used by militias all the way up to the period of resistance. Wooden cannons typically had a range of several to over a hundred meters, with no accurate measure, serving as a medium to short-range firepower weapon.

The construction of a wooden cannon was to hollow out the core of a tree trunk, commonly using tough pine or elm. A deep cylindrical hole was then carved out in the middle of the trunk. The hole tapered inward, with the interior being wider than the exterior and a depth of about one to two meters, with an internal diameter of roughly half a foot. In fact, a thick iron tube should be inserted in the middle of the cylinder to increase power, though it could manage without one. Without iron, the Alliance had to tightly hoop the exterior of the wooden cannon with a copper hoop and then wind it with thick copper wire. To reduce technical difficulty, no touch hole was drilled, and a match cord was used for firing.

Xiulote calculated slightly, a wooden cannon would need a few to more than ten pounds of gunpowder for each firing, while the ammunition would be over thirty pounds of crushed stone. Before firing, a match cord needed to be inserted, and the muzzle would be sealed with cotton to improve airtightness. Its operation was very slow, but at this time in history, its power was nearly invincible.

He then drew the model of a pine cannon on the paper, also noting the upgraded copper cannon.

Next, the young man contemplated softly. Individually operated tube-like weapons were still too difficult a technological reach for the Alliance. The explosive guns and copper firearms of the Song and Yuan periods had a limited shooting distance, were prone to damage, and had an awkward utility, with not a low manufacturing difficulty. And the matchlock guns of that era in Europe were high-grade weapons the Alliance could not produce.

Now, long-range cold weapons still held absolute dominance. At distances upward of several tens of meters, the samurai could still rely on the swift javelins, the powerful longbows, and the formidable Han crossbows.

Having sketched the designs, Xiulote rose to his feet, his heart surging with excitement. He looked towards the eagles in the sky, seeing them spread their wings, soaring at heights unreachable by mere mortals. The young man's aspirations rose with the eagle, encompassing the seas, and swallowing the wastelands!

Fire arrows, ceramic caltrops, wooden cannons—these would be the three standard firearm equipments for the Alliance in the future, accompanying the legions of the Mexica, to thoroughly sweep across the entire world!