

## Civilization 221

### Chapter 221: The Development of Technology, Part One

The weather was clear and cloudless, with a chill breeze blowing, making it a perfect day for work.

Xiulote stepped out of the splendid main hall, and the noise and clamor came from all directions. He heard intense arguments, coordinated shouts, and the sound of tools cutting through wood. The air was filled with the scent of wood and leather.

The young man looked around. The interior of the Texcoco Prince's Mansion had completely transformed. The beautiful gardens had been cleared out to make room for worktables and equipment; the elegant dwellings were altered to store various materials and tools; pits for drying wood and kilns for firing equipment were built in the corners; the only thing that stayed the same was the straw-covered and mud-plastered toilet, which perhaps could be used to pile saltpeter.

Xiulote strode forward. Along the way, people bowed their heads in greeting. The young man waved his hand, signaling the craftsmen to continue. He had already informed everyone to prioritize their work over formal greetings. At this moment, the Divine Revelation Place was a hive of activity, with craftsmen bustling back and forth, dripping with sweat, and samurai in full gear, alert and vigilant—all systems running efficiently.

The central hub of the Divine Revelation Place was the grand hall where he worked. Other areas were divided into north and south sections: the inner layer to the north dedicated to military technology research and the outer layer to the south for the improvement of civilian technology.

It wasn't long before Xiulote arrived at the northeastern weapons research area. A master carpenter dressed in a simple robe was busily engaged in his work.

He was operating a greatbow with limbs, placing a short, stubby, two-feathered arrow onto the arrow track at the center of the limbs. Then he forcefully pulled back the bowstring, securing it in the notch behind the limbs, before leveling the bow and aiming at a human-shaped straw target thirty steps away. With a press of the trigger below the limbs, there was a "buzz," and the short, stubby arrow flew in a slightly wobbling trajectory, piercing the left shoulder of the human-shaped straw target, burying nearly halfway in.

Xiulote watched the master carpenter's operation and nodded slightly.

"Kushinji, well done! You truly live up to your family's reputation as craftsmen passed down in the name of carpentry."

Only when he heard the voice from not too far away did the master carpenter Kushinji turn around. His figure was burly and strong, his face aged and serious without a trace of a smile. His hair had already turned gray, but in every move, he seemed more like a seasoned samurai, clearly having received a traditional samurai education.

Upon seeing the prince, Kushinji simply gave a samurai's salute, then he replied loudly, with a hint of dissatisfaction.

"Prince, how exactly is this crossbow supposed to maintain shooting stability? To lay the arrows flat, we can only use unstable two-feathered arrows, and given their short and thick bodies, they drift off course at just thirty steps! Where is the hundreds of steps range you mentioned?"

Facing the imposing master carpenter, Xiulote was at a loss for words, how could he remember the specific crossbow design in detail?

Indeed, this was the most important research project in the weapons area—the crossbow. And Kushinji was the person mainly responsible for weapons research.

In the Nava language, Kushinji means a professional carpenter, an honorific title passed down and recognized by the royal family. Only the most prominent and skillful master carpenters from the main branch of the artisan families in the capital city could inherit this name.

As a master carpenter, Kushinji originally worked at the center of craftsmanship, holding a revered status. From a young age, he surpassed Kuode, the older carpenter of a family branch. As a result, Kuode returned with the King and due to his leadership in the development of the longbow, he abruptly rose to the position of chief artisan supervisor, with all master carpenters under his management.

Seeing his old brother's smug face, Kushinji couldn't swallow his pride. When Xiulote established a new center for craftsmen, he took the initiative to apply to join. Delighted by the master carpenter's commitment, the young man entrusted him with the important task of weapons research.

The ongoing weapons research included: the development of wooden crossbows, the improvement of long spears and throwing spears, research on incendiary fire arrows, and the trial production of gunpowder on Heavenly Fire Island.

It took Kushinji just two days to modify the crafting process of the three-meter bronze long spears.

The bronze long spear's head weighed about half a jin, sharpened on both sides, allowing for slight slashes besides thrusting. The challenge lay in the processing of the wood. Using hardwood for the shaft, it would be less elastic and more prone to breaking, requiring soaking in oils to increase rigidity.

Additionally, for every meter added to the length of the spear, the difficulty of the processing increased exponentially, as did the labor costs.

Given the current productivity of the Alliance and the needs of the battlefield, long spears of three meters in length were sufficient for use.

After that, the Master Carpenter, following Xiulote's instructions, improved the throwing spears into two types: heavy and light. However, the terms "light" and "heavy" were relative; overall they were still on the heavier side of javelins.

The young man's inspiration naturally came from the javelin-wielding legions of Ancient Rome.

Light throwing spears measured between one and a half to two meters in length with a diameter of about three centimeters. They were tipped with flint and paired with javelin throwers, with a shooting range of twenty to thirty paces, primarily targeting lightly armored militia or for tactical harassment. They were inexpensive to produce and would be supplied in large numbers to light javelin infantry.

Heavy throwing spears, ranging from one meter to one and a half meters in length, were thicker and heavier. Armed with exceptionally sharp obsidian tips, their optimum shooting distance was around twenty paces. Xiulote considered casting lead balls onto the front of the spears to increase their weight and shooting power. In future plans, every Mexica samurai should carry two heavy throwing spears, slotted in the inside of the shield. When facing formations of enemy warriors in cotton armor and leather armor, the strategy was to throw two rounds of dense javelins at close range, and then charge into combat after throwing.

Xiulote had tested the power of the heavy javelins: within twenty paces, they could pierce leather armor and immediately incapacitate the target. Or they could stick in shields, forcing the enemy warriors to abandon their shields. Once they had enough metal, they could fully align with the Roman legions.

As for the incendiary fire arrows, they were in preparation for naval warfare against the Tarasco people, and are still just a concept. The craftsmen were testing various combustibles while waiting for gunpowder to be produced.

The young man's thoughts came from the Battle of Tang Island between the Song and Jurchen Dynasties. The power of early gunpowder focused more on burning rather than explosions. Wrapping gunpowder in paper tubes and binding it onto arrow shafts for propulsion and incendiary purposes, burning the enemy's wooden ships, should be a relatively reliable naval warfare strategy, one that also underwent real combat testing.

Once the purity and potency of gunpowder were further enhanced, simple copper-hooped wooden cannons could be put on the agenda. With an ample supply of copper mines, they could attempt to make the more challenging bronze cannons. And for the even more challenging matchlock guns, a lengthy time and technological progress were required.

Xiulote's thoughts returned from the detailed plans, now focusing on researching crossbows and their mass production.

The young man had investigated the royal army directly under the king and found that only a minority of warriors were proficient with bows and arrows; out of fifty thousand, only a few thousand bow warriors could be recruited. Since mastering the longbow ultimately required years of training, to rapidly increase ranged combat capabilities, they had to rely on crossbows, which were easy to operate and aim, in addition to recruiting skilled tribal hunters.

A week ago, Xiulote roughly described the concept and structure of a crossbow to Kushinji: a bow with a crossbow arm attached. The front end of the crossbow arm fixed the bow, with a groove-shaped bolt track in the middle for placing the bolt, and a crossbow mechanism installed at the rear. The upper part

of the mechanism was a hook for the string, and the lower part was the connected trigger, controlling the release of the string.

This was the young man's understanding of the crossbow, with all other aspects left for the Master Carpenter to figure out on his own. Kushinji held his breath, working day and night. However, in just a few short days, he had constructed a simple wooden crossbow, but this weapon seemed far from sufficient compared to Kuode's longbows.

Facing the dissatisfied Master Carpenter's questions, Xiulote found it difficult to articulate. He took the simple wooden crossbow from Kushinji's hands and examined it closely.

The curved length of the crossbow arm was about one and a half meters, also made from a single piece of wood, which smelt to the young man like fir. The bowstring was about one meter twenty-three centimeters long, rough to the touch, and made from hemp fabric. The groove-shaped bolt track was horizontal, so it could only accommodate crossbow bolts with feathers on the left and right. The wooden crossbow mechanism withstood tremendous force; the hook appeared to be slightly deformed.

Xiulote tried to string the crossbow again; its pull was only just over ninety pounds, still not as much as the Mexica longbows, which had been improved to over a hundred pounds, but stronger than the Tlaxcalan bows.

Then, the young man aimed at the human-shaped straw target thirty paces away, and pulled the trigger. This time, the crossbow bolt traced a downward arc and hit the target's right leg. Kushinji's face darkened beside him, while the Divine Archer Bertade curled his lips.

Watching this scene, Xiulote fell into deep thought. Faced with the familiar crossbow, he closed his eyes, beginning to recall vague details from his memory—from museums to films, to the books he had read.

Everyone around him was silent, their eyes filled with expectation and awe, waiting for His Highness to communicate with the gods and gain yet another "Divine Revelation" from the heavens.

After a while, the young man finally opened his eyes. He looked at the Master Carpenter with a clear and bright gaze, smiling faintly.