I. Dynasty 136

Chapter 136: Iron Mold Cannon Casting

The next day, the King of Wei and his grand fleet departed from Qingzhou's docks.

Xiao Ming watched the fleet with envy, wondering when Qingzhou would have such a mighty fleet of its own.

In Qingzhou's shipyard, his galleons were still under intense construction. He could only hope that, as Zhang Liang had promised, they would have three galleon warships by the end of the year.

Once the cannons were mounted on the galleons, he would take his first step into the era of sailing warships.

But the thought of cannons gave him another headache. The battlefield demanded a large number of them, which meant yet another heavy burden. It seemed that building a powerful navy truly required endless investment.

After seeing off the King of Wei, Xiao Ming headed straight to the Armaments Department.

Chen Qi and the craftsmen were busy casting iron molds. The knowledge repository in Xiao Ming's mind was filled with cannon-casting methods.

Naturally, Xiao Ming wouldn't repeat the mistakes of his predecessors. This time, he adopted the iron mold casting method—a technique that had existed since ancient times but wasn't applied to cannon production until the Qing Dynasty.

The method itself wasn't technically difficult. The real challenge lay in the fact that current craftsmen simply hadn't thought of it.

Sometimes, the difficulty wasn't the technology itself but discovering it.

Now, Xiao Ming had taught Chen Qi and the others the complete iron mold casting technique. For these skilled craftsmen, mastering it was only a matter of time through experimentation.

"Your Highness, we're currently making the clay cannon mold," Chen Qi said as soon as he noticed Xiao Ming's arrival.

The cannon-casting project had kept him awake for days, constantly pondering the method Xiao Ming had taught him.

The weapon Xiao Ming called a "cannon" filled Chen Qi with excitement. As Xiao Ming had said, if the cannons were successfully cast, Chen Qi's name would go down in history.

But after days of leading the craftsmen in attempts, he realized cannon production wasn't so simple. They had already failed several times just making the molds.

Looking at the pile of failed clay molds, Xiao Ming asked, "Failed again?"

Chen Qi looked exhausted and ashamed. “Your Highness, the craftsmen are still unfamiliar with the process. The clay molds keep failing. But now that they’ve gained some experience, I think we’re close.”

Xiao Ming nodded and observed the craftsmen shaping the clay molds.

The iron mold casting process began with dividing the cannon into four to seven sections based on size and creating a clay model for each. Then, for each section, a two-part iron mold was made using the clay model.

The inner surface was smoothed with a turning tool to ensure precision before being dried for use.

Pre-made handles were embedded in the clay molds, becoming part of the iron mold during casting.

To cast the iron mold, the first section (the cannon’s muzzle) was placed upside-down on a clay slab. One half of the mold was filled with clay and dried before being covered with another slab and clamped tightly for casting.

Once the first half was cast, the process was repeated for the other half. This step-by-step method produced a complete set of interlocking iron molds.

For actual cannon casting, the inner surface of the iron mold was coated first with a mixture of fine rice husk ash and sand, followed by a second layer of finely ground coal dust.

The mold was then heated, the clay core inserted, and molten iron poured in. After solidification, the iron mold was immediately removed. While the cannon was still red-hot, burrs were cleaned, and the clay core extracted, leaving the finished cannon.

To reduce the risk of explosions, Xiao Ming planned to replace the clay core with a hollow ceramic one, injecting water into it to cool the barrel—a crude but effective method to improve quality.

With Zhan Xingchang handling the extortion of other vassal kings, Xiao Ming threw himself into the Armaments Department, determined to produce the cannons alongside Chen Qi.

The barbarians' invasion would undoubtedly involve a massive force. To stop them from taking Cangzhou, they needed sturdy walls and powerful cannons—enough to shock the barbarians into retreat.

Unlike the fire tubes of the Great Yu Empire, Xiao Ming's cannons had a range of three to four li, enough to give the barbarians a nasty surprise.

As Chen Qi had said, after days of failure, the craftsmen were finally getting the hang of it.

Though no cannons had been cast yet, the production standards were already set. Xiao Ming categorized the cannons into 6-pounder, 9-pounder, 12-pounder, 18-pounder, 24-pounder, 32-pounder, and 42-pounder classes.

Since these cannons were for city defense, heavy artillery was necessary. Xiao Ming opted for 18-pounders—anything larger, like 32- or 42-pounders, would be overkill. Even 18-pounders could serve as naval guns.

Besides, higher-poundage cannons were bulkier and harder to transport.

By the end of the day, half of the clay molds for the 18-pounder cannons were completed. The rest would have to wait until tomorrow.

After the clay molds came the iron casting. At this rate, it would take at least ten more days before the first cannon could be produced.

Nearly ten days had passed since receiving news of the barbarians' invasion. At this pace, the first cannon wouldn't be ready for another month.

And the barbarians' invasion was likely only five months away—if not sooner.

The thought made Xiao Ming work even harder. After leaving the Armaments Department, he returned to the palace, turning his attention to granulating gunpowder.

As everyone knew, the more powerful the gunpowder, the more devastating the cannon.

Currently, the Great Yu Empire's gunpowder ratios were imprecise, but the formula itself was no secret, and the materials were easy to obtain.

After dinner, Xiao Ming summoned Lu Tong.

Gunpowder was a chemical matter, so Lu Tong was the obvious choice. Green Rose and Purple Iris assisted, and the five of them worked in a side hall illuminated by lanterns.

Before Xiao Ming were charcoal, saltpeter, sulfur, and a small scale. As he measured the ingredients, he instructed Lu Tong, “Grind these into powder—fine powder. Be careful. This stuff explodes.”

Lu Tong paled, his hands trembling slightly. Since studying chemistry under Xiao Ming, he had learned that every chemical they handled was potentially lethal.

Now, Xiao Ming had him working on gunpowder—something with terrifying destructive power. The pressure was immense.

But with the barbarians invading, he clenched his teeth and bore it. This was a matter of national vengeance. To defeat the barbarians, he’d do anything—even if it meant eating the gunpowder raw.

Watching Lu Tong grit his teeth as if wrestling with the ingredients, Xiao Ming grew nervous. “Gently. The finer the powder, the better. Don’t use too much force—are you trying to kill me?”