

I. Dynasty 44

Chapter 44: Steel and Cement

“Of course, let’s go. Prepare the horses,” Xiao Ming called out loudly, snapping out of his thoughts.

The graphite mine had been found, and the limestone mine had also been located. Although the mines hadn’t been fully established yet, and systematic production was still a ways off, it was possible to extract some materials in advance.

However, even extracting a small portion required significant resources. The laborers needed for mining and transportation had to be paid in silver.

This was why Xiao Ming was so eager to collaborate with Liang Dahai. Only with a large number of slaves could the mines and workshops have enough manpower. Then, he could select some strong young slaves to train in various technologies, gradually building Qingzhou’s industrial foundation.

With one master and one servant, the two left the Prince of Qi’s residence and headed to the Machinery Department. Nowadays, aside from overseeing the implementation of various policies at the Governor’s Office, Xiao Ming spent most of his time at the Machinery Department.

At the Machinery Department, Chen Qi was fine-tuning the production line for crucible steelmaking. While the technology was in place, deviations often occurred during actual production.

During this period, Xiao Ming had focused on training Chen Qi, who had received the most knowledge from the tech crystal.

Other craftsmen were only taught specific steps of the process, rather than the entire workflow. Xiao Ming did this to prevent the leakage of technology.

Having ten people each master one part of a process was much safer than having all ten master the entire process.

Moreover, the Machinery Department had implemented strict confidentiality measures. If one person leaked information, everyone on that production line would be punished.

In the Great Yu Empire, craftsmen were considered low-status and were strictly monitored by the government to prevent them from privately manufacturing weapons. Their household registrations were categorized separately as “craftsmen registrations,” making it easy to control their movements in and out of Qingzhou.

“Your Highness, these are the limestone rocks,” Chen Qi said, pointing to a pile of grayish-white stones in the backyard of the Machinery Department.

In modern times, limestone was not only essential for cement production but also a necessary flux in blast furnace ironmaking. Limestone effectively removed sulfur and silicon impurities, improving the quality of the iron and preventing the resulting steel from becoming brittle.

Xiao Ming walked over to inspect the limestone. The pile stood about two meters high, and the stones were of good quality and size.

The two blast furnaces were operating simultaneously, with four workers taking turns operating the bellows to supply air to the furnaces. Craftsmen were pouring iron ore, coke, and limestone chunks into the furnaces.

Red molten iron flowed from one furnace to another, and finally, the wrought iron flowed into crucibles set on one-meter-high stands. When one crucible was full, it was replaced by another.

While this process was still light-years away from modern efficiency, it was a significant improvement over the previous “pouring steel” method and could be considered mass production.

The high-quality steel was then taken by different craftsmen to create farming tools, machine parts, coal stoves, and various other items.

Chen Qi was currently instructing workers to collect the slag, as Xiao Ming had taught him.

Seeing Xiao Ming observing the steelmaking process, Chen Qi wiped the sweat from his forehead and said, “Your Highness, you told me to collect the slag after adding limestone. We’ve gathered quite a bit, but what exactly is it used for?”

“This slag is a valuable material. It can be used to produce something very powerful,” Xiao Ming said with a smile.

This was knowledge Xiao Ming hadn’t yet shared with Chen Qi. Curious, Chen Qi asked, “Your Highness, since the slag is already here, why not tell me? Otherwise, I might not be able to sleep tonight.”

Xiao Ming chuckled. “Actually, besides being used in ironmaking, limestone can also be calcined into a material called cement! Since the slag contains a lot of cement components, it can also be used to produce cement. I had you collect it to avoid waste. Otherwise, it would be a shame to discard it.”

“Cement?” Chen Qi and Qian Dafu exchanged glances.

By now, they were used to the strange terms that came out of Xiao Ming’s mouth. They had no idea where the prince had learned such peculiar knowledge.

Xiao Ming stood with the two of them, and the knowledge from the tech crystal flowed into their minds. After a brief explanation, they understood what cement was and its uses.

“Your Highness, if cement is used to build city walls and pave roads, wouldn’t they become impervious to weapons?” Chen Qi exclaimed in amazement.

“No, cement is just the foundation. Structures made of concrete are truly impervious to weapons,” Xiao Ming said, then went on to explain the concept of concrete to Chen Qi.

“...” Chen Qi was now beyond words to describe his astonishment. He said, “Your Highness, if all the city walls of the Great Yu Empire were built with concrete, the barbarians would have no choice but to retreat.”

Xiao Ming laughed. “You’re getting ahead of yourself. Although concrete and cement are amazing, given our current production speed, we’ll be lucky to meet our own needs.”

After a moment of excitement, Chen Qi suddenly felt deflated. He said, “Your Highness, you’ve taught me so much, but look at the Machinery Department. We don’t have enough craftsmen. We’re already overwhelmed with the current workload. Producing cement will be impossible without more hands.”

Recently, the Machinery Department had recruited more craftsmen, bringing the total to fifty, but it was still insufficient. Xiao Ming sighed helplessly. “I’ll think of a solution. Let’s take it step by step. We’ll produce as much as we can.”

Chen Qi nodded reluctantly.

Xiao Ming had come this time to check on the application of limestone and graphite in ironmaking and to familiarize Chen Qi with cement for future production.

As the saying goes, “To get rich, build roads first.” Smooth transportation could greatly boost production. Given that people in this era lived clustered around cities, building roads wouldn’t require the extensive efforts of modern times, spanning hundreds of miles.

Crucible ironmaking was now well-established, and with the graphite and limestone mines under his control, Xiao Ming essentially monopolized the technology of crucible steelmaking.

However, the lack of labor remained a significant. Currently, the Machinery Department was still operating on a small scale.

Thinking of this, Xiao Ming knew he had to increase his investment in Liang Dahai. Every year, many commoners were captured by the barbarians and traded as goods. Numerous smugglers operated between the Great Yu Empire and the barbarians, engaging in the slave trade.

For slaves, Xiao Ming naturally preferred people from the Great Yu Empire. As for foreign slaves, they were mostly suited for manual labor, given the language barrier.

After spending some time at the Machinery Department and guiding the craftsmen on the finer points of steelmaking, Xiao Ming and Qian Dafu headed back.

On the way, a man on horseback suddenly emerged from an alley and blocked their path. It was Wang Shijie.