

Witch 12

Chapter 12 Firing

Roland stood by the kiln in the backyard, waiting for the first batch of cement being released.

The brick house he had designed for the cement production was fifteen meters long and four meters wide. The front and back had each a door, the front door was as spacious as possible, so that people could easily transport materials into the house. Instead the back door was only one person wide, the only use was to let Anna secretly into the firing room.

Therefore, he also built a wall halfway around the house, the import and export arrangements were guarded by knights — they were Carter's men, loyalty was beyond doubt.

The cement production process was very simple. First the limestone would be grinded into powder, afterwards mix it with clay, iron powder, and then it would be calcined with a dry or wet method. It can be used after the final grinding with plaster. The raw materials were very common, only iron could be difficult to obtain and hold in a large number, the critical fact lies in the process to reach the right calcine temperature.

Roland did not remember the specific temperature needed to produce cement, even if he did remember it, he had not the possibility to measure and control the temperature — whether it was an infrared thermodetector or a thermocouple temperature measuring gun both were not available, this made the production of the cement countless times more complex. He only knew that the temperature was almost similar to the melting point of iron, and the calcination process was also a difficulty in the production of cement.

In the era of the less advanced smelting technology, maintaining the temperature of the furnace has been a problem for all people. The heat loss of an ordinary open furnace was too great, it was difficult to maintain the temperature at 1200 degrees. But he would also need a high temperature resistance furnace, he would have to figure out how to make firebrick. The traditional iron making blast furnace would be forced to the point of melting, temperature may be up to the standard, but the narrow chamber was too small for the cement calcination, Roland was afraid that the time until the Months of the Demons was not enough.

Therefore, Roland's design for the kiln had no heating measures, he purely relied on Anna.

The broken down particle of limestone and clay were mixed together with water into a slurry, this was evenly spread within the kiln. Then the knights locked the door and walked away. Anna entered from the back door, her fire baked the earth slurry until it melted together with the iron powder.

Roland was somewhat restless, this was his first step to upgrade Border Town. If he couldn't produce cement, building a wall within three months would be empty talk. Without the wall, there would be no people willing to stay in this place. Whether it was real life or fictional literature, if you want to progress forward, a stable base is essential.

"Your Highness, this kind of product can really hold the stones together?" Carter, who was at the side of the fourth prince asked. Although the prince had told him this was the latest research results of the

alchemists of Graycastle, but he was still skeptical. After all, those people really haven't made any useful products.

"Who knows? Anyway, they said it would," Roland spread out his hands.

The world of alchemy and astrology were known as the sage art,

in the mainland these professions were very popular. In general the royal family would develop their own alchemist and astrologers, for refining and predict the fate. For ordinary people, these studies were too classy. In view of this, Roland naturally set the source of cement formulations to the alchemical head. As for the chief knight, he didn't matter.

Through the window they could see the flame gradually stopped to burn, it seemed the calcination was done.

When Roland stood up and went to look, Carter was driven out of the garden, so he waited alone in front of the backdoor for the brick.

The gates creaked open and Anna walked out. First thing Roland did was to drape a robe over her, and brought her a cup of water, "how are you?"

The face of the witch was full of dust, due the wet processing system the amount of dust was low, but the hot air needed for calcination produced still some dust. She was not wearing a mask, staying inside for more than 10 minutes was obviously not too comfortable. She coughed and nodded, "the slurry already changed into powder."

Roland waited until the temperature in the kiln dropped low enough, still then he wrapped a wet towel around his head, he grabbed the shovel and got into the back door.

He was instantly surrounded by the hot air, for some time he felt it was difficult to breath, the skin on his hands was roasted immediately. Fortunately, taking a shovel of powder took not much time, otherwise if staying for a few minutes in this environment would cause a high temperature shock.

"Is this what you wanted?" asked Anna, who was now wearing the witch outfit.

"It looks very much like it," Roland spread out the fine powder flat on the ground, using his finger to sense the temperature, "to know it definite we will need to test it."

"What's the use of it?"

"It is for building houses, or repairing bridges and the roads, it can be used in many other places too. If it is successful, afterwards the people will be unafraid of the wind, or that their homes could be destroyed, by the cold, rain or snow." With the other hand he patted the girl's head, "this was only possible thanks to your ability."

Anna lowered her head, Roland did not know if it was or wasn't an illusion, but he felt that the girl's breathing got faster after he patted her.

According to the theory, it is important to fire the grinded materials together with the gypsum, with this it would possible to adjust the hardening time. But now it would be needless to think so much, after a short break Roland took the shovel again and grasped to more, then he called Carter who stood outside

the courtyard over, letting him prepare three different mixtures of the powder with the sand to compound cement mortar.

The chief knight completely didn't mind this manual work, for him, doing this kind of matter was many times better than the substitute fights for his Highness, when he got into a brawl with other young lords while he was on an outing with young ladies (prostitutes) in Graycastle.

Because in the raw material was not added any iron powder, the color and luster that came out were lighter than the average, appearing to be ash gray. Roland spread the grout on a brick, and then putting down another brick upon it. The cement solidification time would be around four hours, but taking into account the preproduction of instability, he intended to simply wait until tomorrow to see the results.

The second day early in the morning, Roland, Carter and Anna hurriedly rushed to the firing place in the backyard. When he opened the door, he saw that the cement had the appearance of the solidification condition, the two pieces of brick were tightly bound together. The consolidation appeared to be uneven, on some places appeared hoar frost.

Roland crouched down, scraping off the aroused hoar frost, trying to press his finger into the hardened cement, the touch made his heart feeling pleased, the cement surface was solid, completely different from the touch of rammed earth, namely, the use of the nail to scrap didn't leave any traces.

Carter repeated the action of the fourth prince, attempting to move the rock, but he also did not succeed. He even resolutely kicked against the side with his foot, until the connection between the cement and earth broke, but the two pieces of bricks were still firmly bonded together. At last, he swung the hilt of his sword against the brick, but only a small piece at a corner broke away

"This is the effect of 'cement', "Carter immediately realized its role," it is incredible. Yesterday it could also flow like a melted candle, just one night later, it's like a rock. With this kind of material, with this building the city wall would go much faster. As long as we have enough stones, we could even build a wall around the border in five years!"

"What's the use of that?" Roland did not accept it as the correct way, "the tall wall would be unable to stop any enemy who comes from the inside. I would rather turn the old wooden homes of Border Town into solid concrete rooms, so that my people no longer need to worry about a natural disaster turning them homeless. "

"....." the Chief Knight was speechless, he really did not expect the fourth prince with all his kinds of bad habits would say this.

"In the future, you will see, Roland reaffirmed himself one more time about the important of the road he would walk — with regard to the numerous battles he needed to fight, science and technology was the first production capability. And here, the witch was the first productivity.