

I. Dynasty 281

Chapter 281: The Globe

After a night of heavy drinking, Xiao Ming still had a headache when he woke up the next morning.

It was the first day of the New Year. Traditionally, people would go out to visit friends and family. If he were in Chang'an, Xiao Ming would be making visits too.

But in the Great Yu Empire, unless it was something urgent, a prince like Xiao Ming was not allowed to leave his fief. Especially since he was in charge of guarding the border, he had even more reason to stay in his prefecture.

Now that New Year's Eve was over, the first thing on his mind was sending the galleons out to sea.

After setting up the plan to spread the stage play quietly among the people, he headed to Bowen Academy. Others could rest for the New Year, but not Yue Yun—he was the leader of the three galleons and needed one last important lesson.

"Your Highness, is this the final lesson before we go out to sea?" Yue Yun was already waiting in the classroom early in the morning.

Xiao Ming nodded. He had delayed their departure for two reasons. First, the cannons still hadn't been loaded onto the ships. Second, Yue Yun and the others still hadn't learned the most important thing in sailing—how to know where they were in the middle of the sea.

There were only three students in the room: Yue Yun and two other sailors who had done well in class. Xiao Ming had chosen them to be the navigators of the fleet.

He sat down and said, "One lesson won't be enough for this. The things you are about to learn are complex. You must stay focused, or you could get lost at sea and never return."

Yue Yun and the other two nodded seriously. They had never seen Xiao Ming so strict before.

Xiao Ming raised his hand, and a servant brought in a round object—a globe. It was mounted on a base, with a rod running through the middle.

"You once asked what the world looks like. Now, it's right in front of you," Xiao Ming said, pointing to the globe.

This globe was made of wood, polished until it was smooth. It showed the Earth's longitudes and latitudes, world maps, ocean routes, and even marked where reefs were. It also had labels for regional goods like corn, cotton, sugarcane, and gold.

"This is the globe?" Yue Yun asked, eyes wide with shock.

Xiao Ming nodded. The globe was one meter wide—big enough to show the whole world map clearly. He had ruined more than ten globes before this one turned out right.

Xiao Ming pressed it, and the globe started to spin. Oceans and continents moved past their eyes.

“We’ll start with the basics. First, you need to learn the names of all the oceans and continents.” Xiao Ming began teaching them about the four oceans and seven continents.

This was a crash course, where they just had to memorize everything, and Xiao Ming was good at teaching that way.

He pointed out each region on the globe and explained its location and importance. Once the geography part was finished, he moved on to the real topic.

“Now that you know how big the world is and that there are many countries, let’s talk about how to find your location while at sea,” Xiao Ming said.

The three students sat up straighter, no longer feeling proud. Over the past months, they had realized just how little they knew.

“This is a quadrant,” Xiao Ming said, holding up an instrument used for sailing.

What he had was a Davis quadrant, created in the late 1500s by a British sailor. It was used to measure latitude during ocean voyages and was more accurate than earlier tools. It worked by using a shadow on a scale to show the sun’s height in the sky, which could then be used to calculate your position on Earth.

Building the quadrant had taken time and care. Though its design was simple—two bent wooden sticks joined together with a scale—it needed very precise markings. That’s why this one was fifty centimeters long, to make it easier to mark and reduce errors.

“Your Highness, you can really use this to calculate latitude?” Yue Yun asked.

“Yes. But this is just the tool. You also need to learn the formula,” Xiao Ming said.

He walked to the blackboard and wrote:

1 degree of latitude \approx 111 kilometers

1 minute of latitude \approx 1.85 kilometers

1 second of latitude \approx 30.9 meters

Distance between two points = $111.12 \times \cos^{-1}\{\sin(\phi_1) \times \sin(\phi_2) + \cos(\phi_1) \times \cos(\phi_2) \times \cos(\lambda_2 - \lambda_1)\}$

When they saw the formula, Yue Yun held his head. “Your Highness, can we skip this part?”

“No,” Xiao Ming said firmly.

Their math skills were very basic, and there wasn't time to teach more. Xiao Ming just needed them to understand and use this one formula.

To make it easier, he would also give them a chart with pre-calculated values. Even if they couldn't do the math, they could still use the chart to figure out where they were and avoid getting lost.

Before studying sailing, Xiao Ming had thought it was simple. But now he knew how complex and technical it really was. In the 18th century, following the coastline didn't count as real ocean navigation.

This was the final lesson before Yue Yun set sail—for trade, for the treasures of the world, and for building up wealth and power in his six prefecture.