

The Astronomer

The musty classroom near the Bairro Alto was sparsely furnished, with only a few desks and chairs. By the door was a slate board on a stand, covered with sketches and mathematical symbols. The teacher Abraham, a mathematician and astronomer of repute, had worked in Sagres with Henry the Navigator, and studied Ptolemy, the Arabs, Venetians, and Genovese. He corresponded little with his fellow academics in the Italian republics, Flanders, or Spain, but was regularly informed of their progress through the king's spies. John II was both ambitious and forward-looking, and together with his advisers had devised the strategy for an Atlantic empire. The siege of Ceuta in 1418–19 and the campaigns of Tangier and Asilah of John's father, Afonso the African, had severely drained Portugal of men and resources, depleted from fighting the Berbers in the Maghreb in the name of the holy cross.

Four men sat in front of Abraham that day in the University of Lisbon. All hand-picked, all seasoned in the African adventure. Pero de Alenquer, known as "the Pilot," listened as the scholar explained the intricacies of celestial cosmography, map-making, and global navigation. On a table were two charts: the first showed the world through Venetian eyes, with a large land mass of Europe, the Mediterranean sea and North Africa, and the Asia of Marco Polo.

"This map of the world provides us with the current view of world geography. Unfortunately, it has three problems." Abraham paused for effect. "They are called west, east and south." The men laughed; having already charted part of the West African coast, sailing barques and caravels with Eanes and Cintra, they could see the errors in the chart.

"Toscanelli believes the route to the Indies is to the west." The astronomer smiled. "The Perfect Prince has already dismissed Columbus from court, and the Genovese adventurer now seeks the patronage of the Catholic Kings. Our Spanish friends would do well to seek a western passage, whilst we steer east."

The teacher examined the group in front of him: a captain and three pilots, all experienced travelers, men whose seafaring feats were well known. One of the pilots, Escobar, had explored the route to Sierra Leone and was well acquainted with the West African coast of Guinea, having sailed east some three hundred fifty leagues to Elmina.

The discussion shifted to currents and winds, for these were a major key to the success of the Indian endeavor. Escobar, who had sailed with Cão, described the journey to the Congo. "Our caravels made plain sailing to Cape Verde, and we anchored at the old town of Praia, sheltered by the fortress, and replenished

provisions. On land, I used an astrolabe to take the weight of the sun and confirmed our latitude as fifteen degrees north.”

“And what of currents and winds?” the astronomer asked.

“Favorable down the west coast of Africa. The northeast trades blow true until equatorial latitudes, and the current from the Fortunate Islands carries us south. We sailed down past Sierra Leone, and at ten degrees, the waters divide.”

“How so?”

“The Canaries waters make a turn to the west; Cão ordered our ships to follow, hoping to avoid shallows and reefs, squaring south and east at sea.”

But the currents and the winds had pushed them farther west, and the captain had ordered the two caravels to tack to windward, making once more for the African coast. The ships had approached the coast and hugged it south and east, making a heading to São Jorge da Mina, but progress was slow.

“And after Elmina?” Captain Dias asked.

Escobar was silent, his face clouded with memories. Consulting his log, he picked his words carefully. “After the Gold Mine of St. George, navigation is increasingly difficult. We headed south by southeast, keeping the coast in sight, and for perhaps a hundred and fifty leagues were becalmed.”

In this area of the Gulf of Guinea lie the doldrums, which will challenge any progress. No wind blows, or else it is both weak and inconsistent.

“Astrolabe readings placed us around the equator, sometimes a few degrees north, others a few degrees south.”

Abraham looked at his charts. His collection was vast, though inaccurate. His sources were some of the greatest Jewish cartographers from the Balearics and Catalonia—men like Jacome of Maiorca, Jehuda ibn Verga, and Abraham Zacuto, and more recently the celebrated cosmographer Martin of Bohemia. Like him, most were Sephardi Jews.

“Let me take you back in your journey, pilot. When Cão headed west after Santiago, how far did he go?”

“After Cape Verde? Hard to tell exactly, maybe a hundred leagues, perhaps a hundred and twenty.” The pilot glanced at Alenquer, embarrassed.

His colleague gave Abraham a practical account. Alenquer explained that when out of line of sight, the pilot had little chance to accurately measure progress along the parallel, depending on rudimentary time estimates with the hourglass, Genovese needle, and dead reckoning. Abraham the astronomer understood that the Portuguese sailors were helpless to determine longitude at sea. He made a mental

calculation. "Hmm, maybe to the twenty-fifth meridian, then. And how was the wind? And the current?"

"A lot better than in the Gulf! A good southeast wind, and a favorable drift, headed west."

"But the wrong way!" said Captain Dias scornfully.

Abraham turned his blue eyes on him. "Maybe, captain, maybe."