

The Golden Palm

The Pilot Alenquer, Captain Dias, and the others once again sat in the small room at the University Houses, the window open to the warm summer breeze. Prince Henry had donated the houses in 1441 to replace rented accommodations, together with instructions for teaching the seven liberal arts. Henry had underscored the arts of “aremetic,” geometry, and astrology. Now Abraham came in, talking softly to Martin Behaim. The teacher’s step was shortened by the stiffened gait of age, and he rested his arm on the younger man, as much for company as for balance.

“My friends,” Abraham said, “we are nearing the end of our time together, and soon you will set sail. We have given you our knowledge so you can build our world. After today, there will be only one more lesson. Martin?”

The young astronomer stood and spoke in his strange, high-pitched voice. “My name is Behaim, also known as Martin of Bohemia. Ve today are discussing tides.” The grown men glanced at each other with hidden smiles, like schoolboys remarking on the funny Germanic accent.

“Ze tide is principally based on the moon and sun, and as you know a good spring flood can lead you into a bay with ease, just as an ebb will lead you far out to sea. Coastal navigation is much more than knowing the wind. And how wital is ze tide for naval engagement?” he looked at each of them in turn, his furrowed eyebrows aiming comically at the roof. Alenquer met the gaze of the penetrating blue eyes, and waited.

“Ze tide flux and reflux has been known for a thousand years. The Phoenicians knew about it in Cadiz—they had worked out the conjunction of the moon and the sun. Of course to the east there was no need, because there is so little tide. Also like my native Baltic Sea.” He smiled, looking insanely at Abraham, and roared with laughter. “No wonder those Romans and Greeks thought they were reaching a sea of monsters and devils, but of course zis were ze Portuguese!”

The men fell prey to his charismatic delivery; clearly this was a man who carried his science lightly, so comfortable was he with its depth.

Martin went on to describe the timing of the moon’s thirty-day orbit and how the relationship with the earth’s twenty-four-hour rotation delayed the tide by forty-eight minutes each day. He spoke of tidal prediction and explained how the wheel of hours—divided into quadrants, each with six hours and eight directions—could be used to tell the tide.

“At midday, ze sun is to ze south, at three PM it is at southwest, at one-thirty in the morning it is at north by northeast. As you can see on my wheel!” He whipped out an hour rose from under his robes, a manic grin on his face.

Abraham sat back, enjoying the show.

“But you cannot see it in ze sky,” he shouted, “because it is ze deep, dark night. So you vill use ze guards, but you all know that, because you are great sailormen, ja?” he pronounced the word gu-ards and the men laughed heartily and nodded. The Portuguese sailors had long known that the two brighter stars on the far side of the Little Bear were ideal for fixing the Arctic pole.

Alenquer knew the constellation as the *Buzina*, or horn, with the mouthpiece carrying the North Star, while the two guards stood at the sound hole. The guards were used for telling the time at night, though of course that applied only if you sailed close to the meridian. Going west or (as he hoped) east was an altogether different tale, unless you knew how far across you were.

Behaim was now rolling forward like a mighty ship, telling them about tidal delays. “From the Barbate in Andalucia up to Galicia and the Biscay, count six hours flood and six hours ebb as follows: northwest and southeast, low tide. North and south, half-flood; northeast and southwest, high tide. East and west, half-ebb. And this you have through the strait of Ceuta down the Barbary Coast, whether the moon be full, new, or half!” His words came in staccato fire. “And when the moon and the sun are in conjunction,” he pronounced the word exquisitely, drawing smiles, “which you may calculate mit your naval techniques, the high tide will have ze sun at southwest and at northeast. After that, for each day you must use the rose, one *quarta*, of which there are thirty-two, for each day. So you must count ze age of ze moon, like a small child!” once again he laughed uproariously, strands of hair flying in various directions, the robe flapping against his skinny legs.

For a while he continued, explaining about the tides down the West African coast, how at the mouth of the Senegal and the other great rivers the tides were known to be contrary, with the high tide at northwest and southeast. Precious words, carefully noted by the pilots, confirming and extending their own observations. These men were responsible for accurate navigation, which assured the success of the mission and the safety of the crew. Large river estuaries were routinely entered and presented some of the greatest sailing hazards. The geography of Africa was so poorly known that every potential passage needed to be explored. Always, it quickly became clear that the seawater freshened and they were not entering an eastern sea. However, the chance for fresh water, fruit to allay scurvy, and the taste of fresh meat held an irresistible allure.

There would have been mutiny if the captains did not put in at certain ports, particularly those where the men knew from sailors' yarns that sexual favors awaited them. The punishment for women on board was death, the unfortunate lady being cast overboard and the culprits lashed. Though by the very nature of men, girls were occasionally smuggled on board, retribution was as severe as was the captains' tolerance during shore time.

The Bohemian lowered his tone and spoke almost mystically. "So finally I tell you about the Golden Number." For his audience, as for all men of their time, gold and magic were subjects of fascination.

"Since the Greek Meton, two thousand years ago, we know that every nineteen years there are two hundred thirty-five lunations, and that *within each nineteen-year cycle, ze novilunes occur in ze same days of the month, if we number the years sequentially*. Please, examine zis!" Ever the performer, he whipped the glove off his left hand and held up his arm, inches from Dias's nose. The men had thought the glove was just another Bohemian eccentricity on a hot June day, but now they saw that Martin had numbers written all over the palm of his hand. Looking at their gaping faces, Behaim once again roared with glee. "One on ze tip, one on each knuckle—look! For ze thumb, she has only three, but ze others, zey have four each, even ze pinky. Maybe, he is not so small!" he beamed and wagged his painted little finger dangerously close to Alenquer's nostril.

"So three for ze thumb, add four times ze others, hmm..." He pretended to calculate. "So, nineteen! Now I give you ze formula: change one thousand for twelve, one hundred for five, twenty for one, and then you count." The men looked at him blankly. Abraham was frowning in concentration.

"So I explain. We are in 1486. So ... twelve for one thousand, twenty for four hundred, four for eighty. Zen you must add ze six. And ve get?"

Alenquer said, "Forty-two, Professor."

"Ach, do not call me Professor, I am crazy astronomer schoolboy mit finger paint! But on ze first part, you are correct!" He gave the pilot his mad look. "So you cycle nineteen on your hand, you will need to go round twice, and will end at ze tip of your index finger. Golden Number is four! Now, look at this table." Once again, from under the robes a prop emerged, this time a manuscript table, which he unrolled. Twelve double columns had the months of the year, and in each double column, the left side had the Golden Number, the right the day of the month.

"Let us take this June; with our Golden Number Four, the new moon, the novilune, is on the twelfth, and by counting ze age of ze small child, you may know ze rest. We are finished here, sailors!" the eccentric German beamed. "Come

Abraham, let us refresh ourselves with your cinnamon wine! Pilot, I give you now my table, but you must never call me zat name again!" He gave Alenquer a look of complicity. "You see, ven you tighten the noose of formality, you choke ze imagination!"