# Omar Khayyam

A picture book by Joe Polsky

Each year, rose bushes blossomed in Nishapur, scattering their petals. Travelers on Silk Road who wandered through the city marveled at the flowers in a hundred different languages (I). It was here that Omar Khayyam was born in 1048. Though one day he would grow to be a great mathematician, astronomer, and poet, renowned throughout Persia, for now, he was the son of a tentmaker (II).
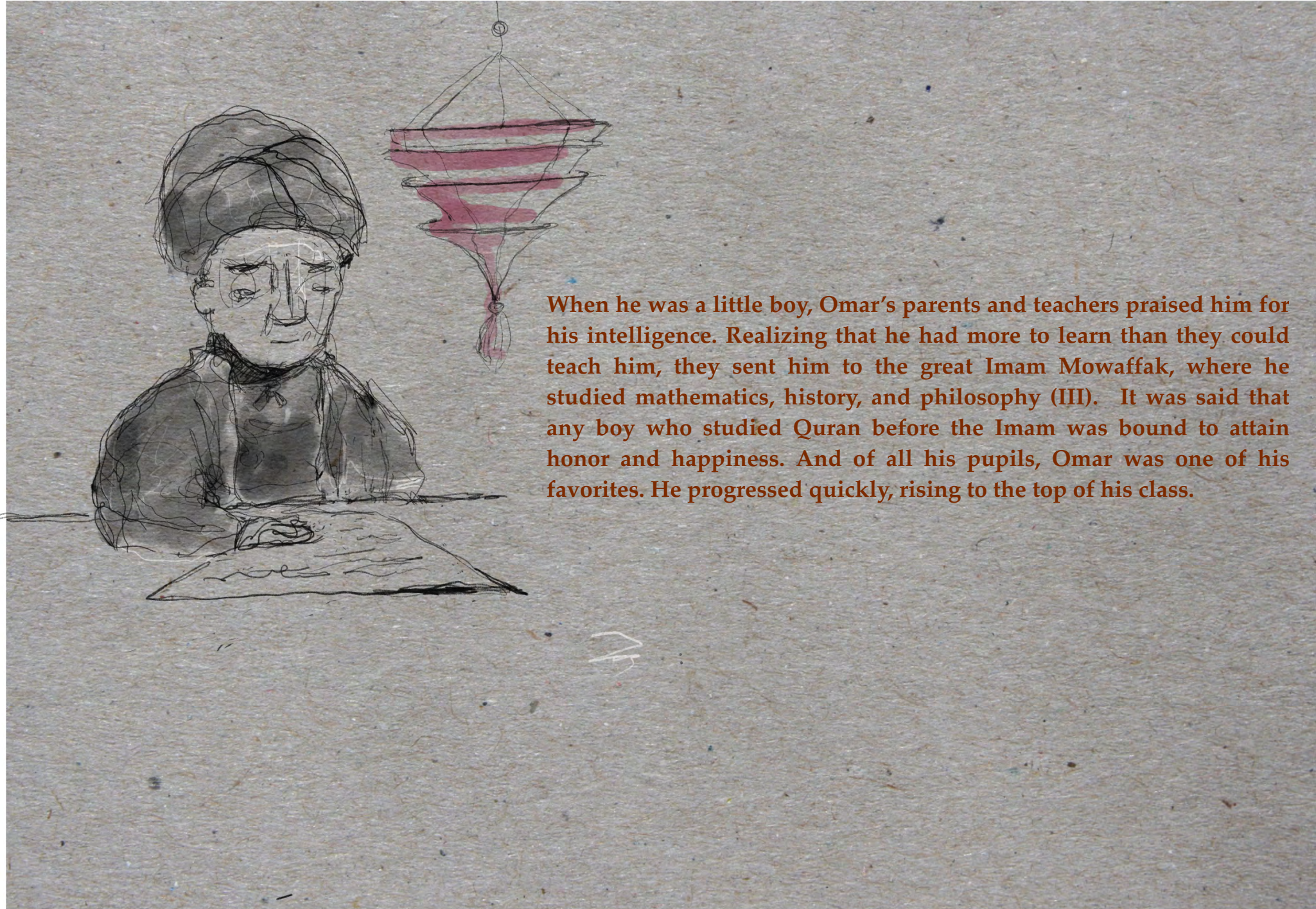
When he was a little boy, Omar's parents and teachers praised him for his intelligence. Realizing that he had more to learn than they could teach him, they sent him to the great Imam Mowaffak, where he studied mathematics, history, and philosophy (III). It was said that any boy who studied Quran before the Imam was bound to attain honor and happiness. And of all his pupils, Omar was one of his favorites. He progressed quickly, rising to the top of his class.

While studying under the Imam, Omar met his two best friends, Nizam ul Mulk and Malik Shah. They repeated lessons to each other after class and dreamed of the greatness they would achieve when they left Nishapur to see the wider world. In love with philosophy, mathematics, and astronomy, the three friends pledged to each other: "let us make a vow, that to whomsoever this fortune falls, he shall share it equally with the rest, and reserve no pre¬eminence for himself." (IV)
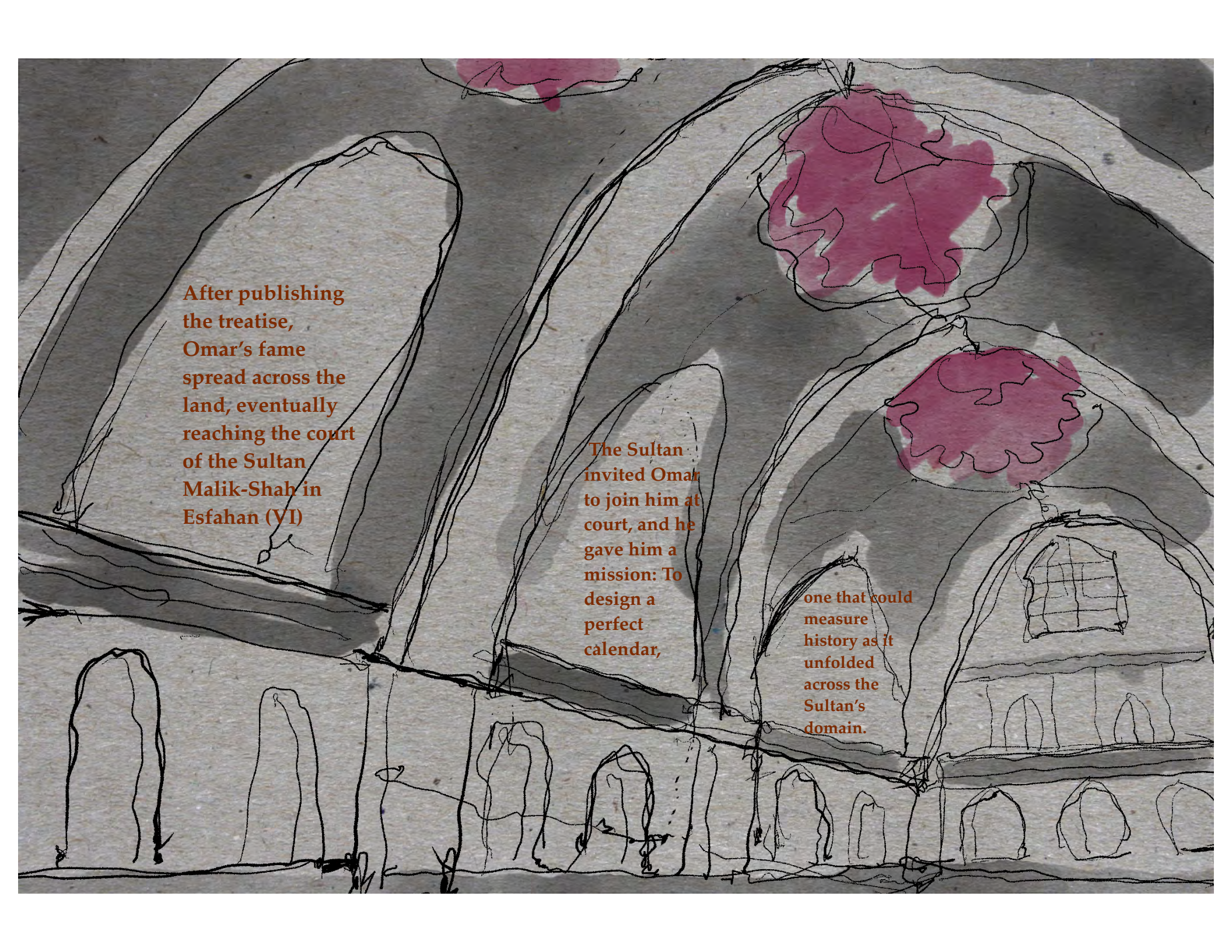
The whole world passed through Nishapur, and Omar grew curious watching travelers make their way down and past the only streets he'd ever known. When he was a young man, he decided it was time to follow those travelers, to leave and seek his fortune. He said goodbye to his friends and set off.

Adventure!

Europa

Mare Caspium

Samarkand
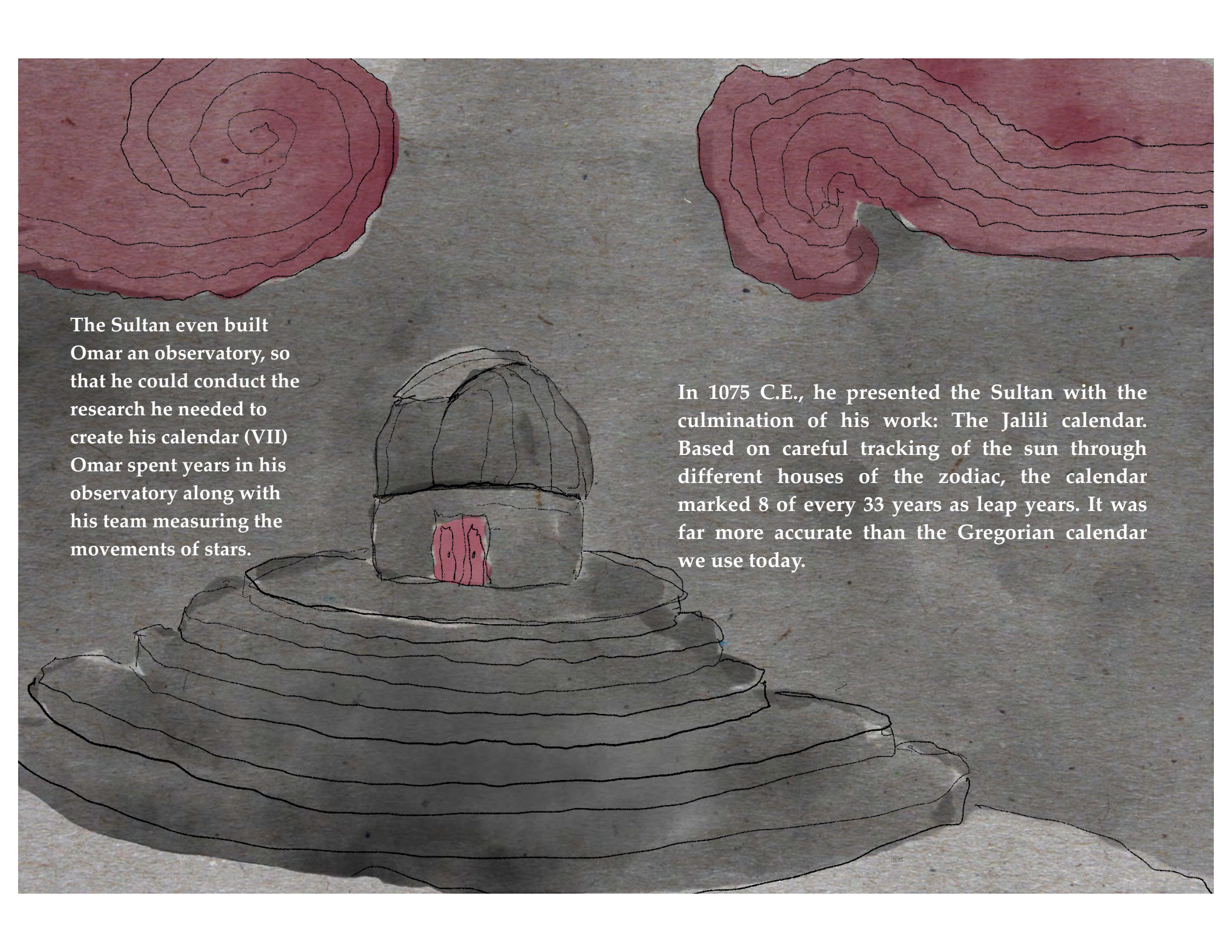
Nishapur

Mare Internum

Sinae

Arabia

India

Africa
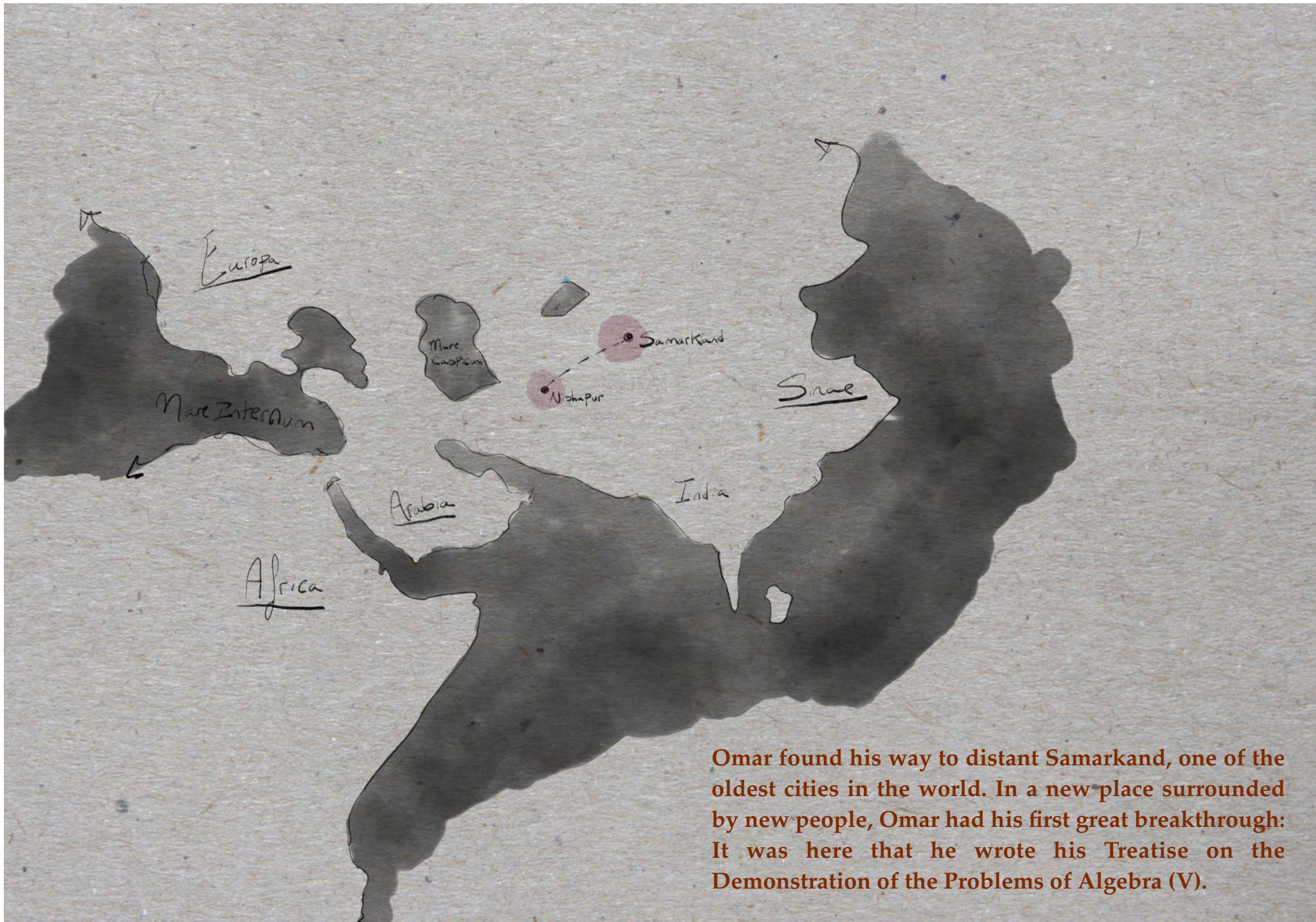
Omar found his way to distant Samarkand, one of the oldest cities in the world. In a new place surrounded by new people, Omar had his first great breakthrough: It was here that he wrote his Treatise on the Demonstration of the Problems of Algebra (V).

After publishing the treatise, Omar's fame spread across the land, eventually reaching the court of the Sultan Malik-Shah in Esfahan (VI)

The Sultan invited Omar to join him at court, and he gave him a mission: To design a perfect calendar,

one that could measure history as it unfolded across the Sultan's domain.

The Sultan even built Omar an observatory, so that he could conduct the research he needed to create his calendar (VII) Omar spent years in his observatory along with his team measuring the movements of stars.

In 1075 C.E., he presented the Sultan with the culmination of his work: The Jalili calendar. Based on careful tracking of the sun through different houses of the zodiac, the calendar marked 8 of every 33 years as leap years. It was far more accurate than the Gregorian calendar we use today.

But just as Omar's star was rising and his fame seemed assured, the Shah, Omar's great patron and ally, was killed (VIII).  In his absence, the queen turned against Omar. He fled from court, abandoning the life he'd built for himself in Esfahan, and he turned to God. Omar began a pilgrimage to Mecca (IX).
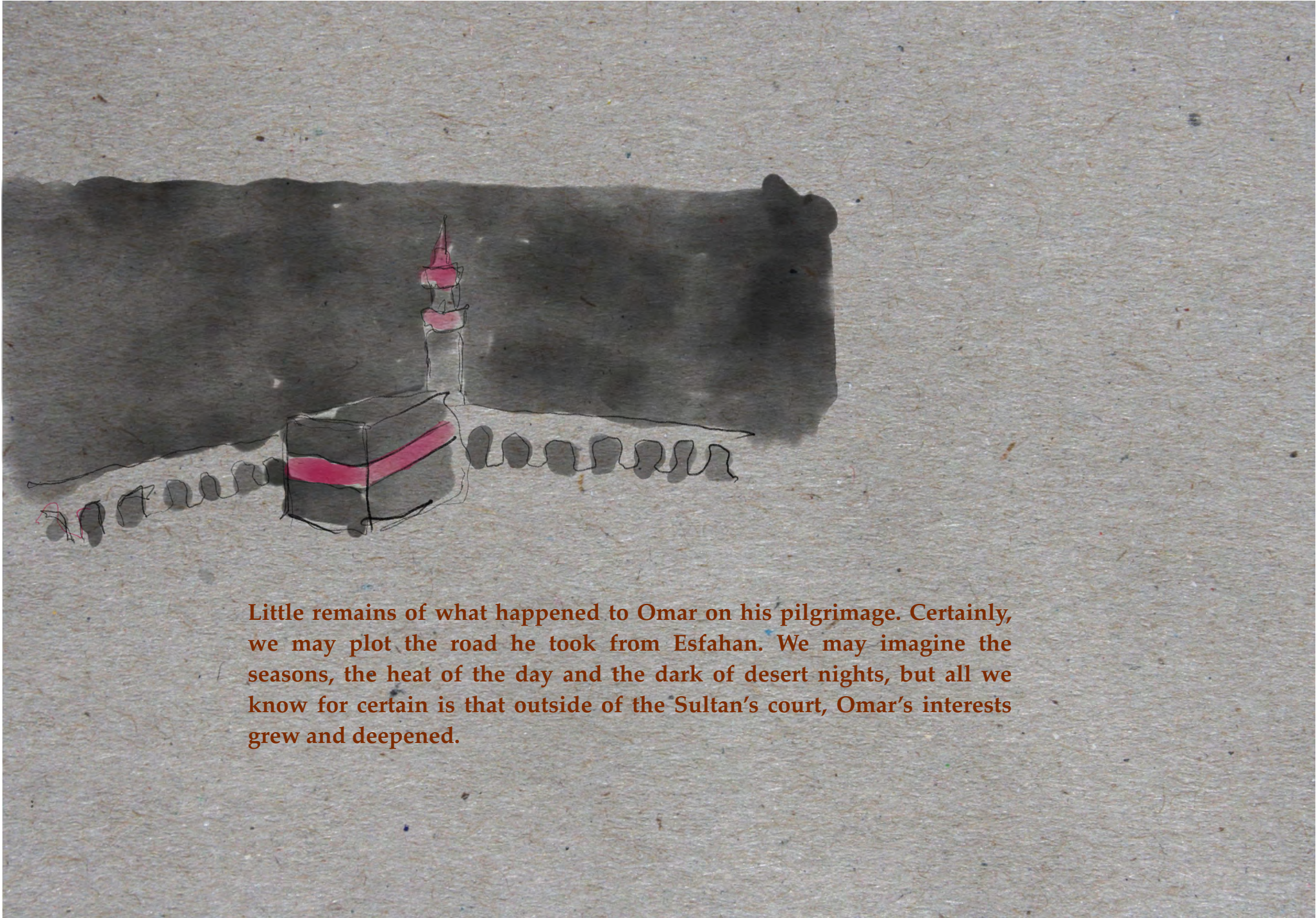
Little remains of what happened to Omar on his pilgrimage. Certainly, we may plot the road he took from Esfahan. We may imagine the seasons, the heat of the day and the dark of desert nights, but all we know for certain is that outside of the Sultan's court, Omar's interests grew and deepened.

Free from court, Omar began to write poetry. He was drawn most to quatrains, stanzas composed of four lines. Often, Omar's quatrains were grouped together in long poems, but each one could be read by itself (X). Today, his Rubayat is one of the most famous works of poetry of his age. It begins:

Awake! for Morning in the Bowl of Night

Has flung the Stone that puts the Stars to Flight:

And Lo! the Hunter of the East has caught

The Sultan's Turret in a Noose of Light.

Omar returned to Nishapur later in life, ready to live out the rest of his days in the city of his youth. The Vizier (XI) offered him a position of power and responsibility, but all Omar wanted was a comfortable yearly pension of 1200 mithkals of gold from the treasury and the opportunity to live and work in peace. When he died as an old man, his students buried him on a hill, which the north wind covered with petals every year when the rose bushes bloomed (XII).
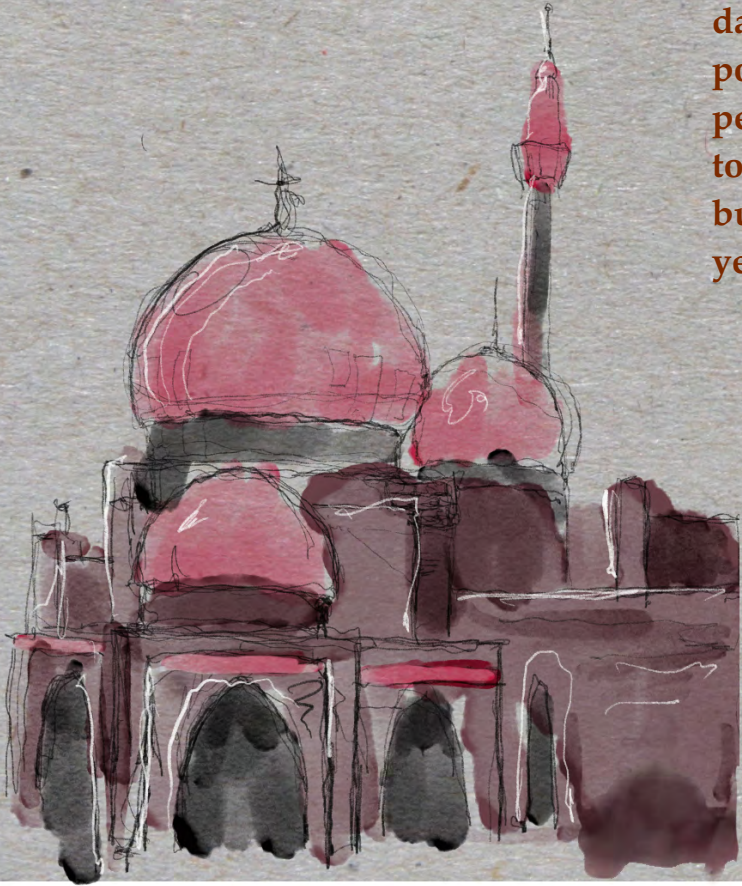
# NOTES:

(I) Stretching from China all the way to distant Europe, the Silk Road provided a means for merchants from Asia to exchange their silk for the wool, gold, and silver of Europeans. Such trade presented an unprecedented opportunity for cultural exchange. Through such exchange, the Silk Road facilitated extraordinary innovation in artistic techniques (particularly in the field of ceramics), scientific developments, and religious conversion.

(II) In fact, as the noted scholar and translator Edward Fitzgerald indicates, "His Takhallus or poetical name (Khayyam) signifies a Tent-maker, and he is said to have at one time exercised that trade, perhaps before Nizam-ul-Mulk's generosity raised him to independence. Many Persian poets similarly derive their names from their occupations; thus we have Attar, 'a druggist,' Assar, 'an oil presser,' etc.[2] Omar himself alludes to his name in the following whimsical lines:— 'Khayyam, who stitched the tents of science, Has fallen in grief's furnace and been suddenly burned; The shears of Fate have cut the tent ropes of his life, And the broker of Hope has sold him for nothing.'"

(III) The Imam Muwaffaq Nishabur was renowned as the greatest teacher across the Khorasan region. He tutored exceptionally talented students such as Omar, but the majority of his pupils were probably the children of nobility.

(IV) An excerpt from Nizam ul Mulk's own writings, quoted originally in Calcutta Review, No. 59.

(V) The treatise details how to solve cubic equations through intersecting conic sections.

(VI) Malik-Shāh was the Sultan of the Seljuq empire. During his reign, he expanded his territory extensively, bringing the Qarakhanids into the fold, and even extending some control over Mecca, Medina, Yemen, and the Persian Gulf territories. His rule was further characterized by extensive patronage of the arts and sciences. The Sultan brought great numerous great artists and thinkers to his capital, Esfahan, which grew renowned for its extraordinary architecture and the scientific advances that it inspired.

(VII) Prior to Khayyam, the calendar system employed within the Seljuk Empire was subject to change from ruler to ruler. In recruiting Khayyam to create a more consistent measurement, at a symbolic level the Sultan ensured that all subsequent recorded history would be made in his name. The Jalali calendar that Khayyam came up with eventually was reportedly in use until the 20th century.

# NOTES:

(VIII) Many speculated that the Sultan died as a result of an assassination attempt, though this claim has never been substantiated. All that is known definitively is that during his reign, a substantial anti-orthodox terrorist assassin movement arose, and shortly prior to his death, his relationship with his own vizier and family deteriorated on account of a succession dispute.

(IX) As far as I have been able to tell, the reason that the queen turned on Khayyam remains unknown.

(X) Though comparatively less-known, many believe that Khayyam's work influenced poets such as Hafiz, ensuring his place in the Persian literary canon.

(XI) The highest-ranking political official without a claim to the throne, the vizier's primary role was to advise the king and oversee logistical and political matters.

(XII) According to Fitzgerald, one of Khayyam's many students tells us that he predicted "'My tomb shall be in a spot where the north wind may scatter roses over it,' and indeed it was so."

# BIBLIOGRAPHY:

Hansen, Valerie. The Silk Road: A New History. First issued as an Oxford University Press paperback. Oxford New York Auckland: Oxford University Press, 2015.

Katz, Victor J. A History of Mathematics: An Introduction. 3rd ed. Boston: Addison-Wesley, 2009.

Encyclopedia Britannica. "Omar Khayyam | Persian Poet and Astronomer." Accessed October 8, 2019. https://www.britannica.com/biography/Omar-Khayyam-Persian-poet-and-astronomer.

Omar Khayyam, and Edward Fitzgerald. The Rubaiyat of Omar Khayyam. 1st and 5th eds ed. Dover Thrift Editions. New York: Dover Publications, 1990.

Omar Khayyam, and Daoud S. Kasir. The Algebra of Omar Khayyam. [New York: AMS Press, 1972.
Rāshid, Rushdī, and Régis Morelon, eds. Encyclopedia of the History of Arabic Science. London ; New York: Routledge, 1996.

Seyed-Gohrab, A. A., ed. The Great 'Umar Khayyām: A Global Reception of the Rubáiyát. Iranian Studies Series. Leiden: Leiden University Press, 2012.

Encyclopedia Britannica. "Silk Road | Facts, History, & Map." Accessed October 23, 2019. https://www.britannica.com/topic/Silk-Road-trade-route.
: