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rect.

[6] The midpoint of the equator is called the Cupola of the Earth, where the longitude is 90 degrees. This is because west of that location is the western part of the settled world, and east of it is the eastern part of the settled world—God is all-knowing of the Truth.

### CHAPTER THREE

#### On the Characteristics of Localities Whose Latitudes Are Less Than or Equal to the Obliquity

[1] Every locality that has latitude is reckoned among the “oblique horizons,” because the turning of the equinoctial there is slanted. The right sphere does not occur anywhere other than the equator. When a latitude is assumed for a horizon, one pole of the equinoctial that is in the direction of the latitude stays above the horizon by the amount of the latitude, and the other pole is depressed [below the horizon by the same amount]. The day-circles whose distance from the equinoctial pole is equal to or less than the local latitude neither rise nor set, but rather those that are about the visible pole are permanently visible, and those that are about the invisible pole are permanently invisible.

[2] The year has four seasons as usual, except in locations whose latitude is less than the obliquity, where the Sun passes over the zenith twice, and thus the heat will be intense at these two times. Between these two times, when the Sun is closer to the visible pole in the direction of the solstice, there is a lessening in the heat of the air. During this time, the shadows of objects at noon fall toward the invisible pole, [whereas] during the rest of the year the [noon] shadow falls toward the visible pole. On those two days when the Sun passes over the zenith, there will be no shadow [at noon].

[3] The horizon circle divides the equinoctial into two halves, and other day-circles into two unequal parts. Of those [day-circles] that are in the direction of the visible pole, the visible part is larger, while of those [day-circles] that are in the direction of the invisible pole, the visible part is smaller. For any two day-circles equidistant from the equinoctial on its two [opposite] sides, the visible part of one is equal to the invisible part of the other. Therefore, when the Sun is at the beginning of Aries or Libra, daylight and nighttime are equal; when it is in the direction of the visible pole, the daylight of any part [on the zodiacal equator] is equal to the nighttime of the part diametrically opposite. For any two parts that are equidistant from the equinoctial on the same side, such as the beginning of Taurus and the beginning of Virgo, their daylights and their nighttimes are equal. Summer is longer in these localities because the Sun reaches the zenith twice; and the greater the local latitude, the closer the two points on the zodiacal orb that pass over the zenith, and the smaller the arc between them.

[4] The two poles of the zodiacal orb rise and set. The period of visibility of the pole that is not in the direction of the local latitude is as much [as the period] that the arc between the aforementioned two points that pass over the zenith is on the meridian. Its period of invisibility, and [the period of] visibility of the [other] pole that is in the direction of the local latitude, is the rest of the revolution. During the two times when those two points are at the zenith, the two poles of the zodiacal orb will be at two points [on the horizon], and the zodiacal orb's intersection with the horizon will be at right angles, i.e., the zodiacal orb is one of the altitude circles.

[5] As for those places whose latitude is equal to the obliquity, which are the hottest of all localities according to Master Abū ʿAlī, one pole of the zodiacal orb is permanently visible and one pole is permanently invisible. The Sun always passes in the direction of the invisible pole except for one day, when it reaches the beginning of the solstice in

the direction of visible [pole]. On that day, the [Sun] will be at the zenith. and no shadow falls. In all other times that a shadow falls, it is in the direction of visible pole. When that solstice is at mid-heaven and at the zenith, the zodiacal circle coincides with the circle of the initial azimuth. Therefore, in these localities, every point whose day-circle is between the two poles of the equinoctial and the zodiacal orb is permanently visible or permanently invisible, while all other day-circles have both [periods of] visibility and invisibility.

[6] These characteristics, and other ones that we are going to mention, are common for the northern habitations and southern habitations. The winter and summer of these two sides alternate, i.e., when it is summer in the north, it is winter in the south and vice versa. The other two seasons are like this too. Places in the south whose latitude is equal to the obliquity are hotter than the ones whose latitude is equal to the obliquity in the north, because of the [place of] apogee and perigee, as we have mentioned. Some of the practitioners of this science call such localities the “combust way,” because there is no place hotter than those on the surface of the Earth. These are the characteristics of these localities—and God is all-knowing.

#### CHAPTER FOUR

##### On the Characteristics of Localities Whose Latitude Is Greater than the Obliquity, up to Where It Is Equal to the Complement of the Obliquity

[1] In these localities, all the day-circles of the zodiacal orb pass on one side of the zenith, and no part of the zodiacal orb reaches the zenith. The two poles of the zodiacal orb have two day-circles, one visible and one invisible. The [visible] pole in its day-circle has two extreme altitudes: one the highest altitude and the other the lowest altitude, at both of which times it will be on the meridian circle; the