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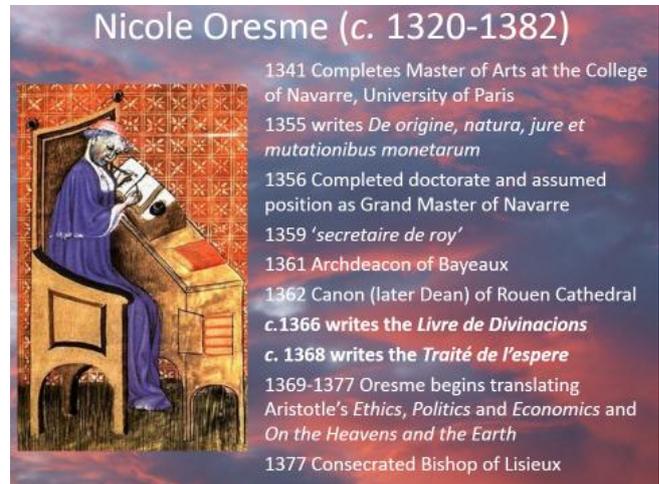
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Nicole Oresme's treatises on cosmography and divination: a discussion of the *Treatise of the Sphere*

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Nicole Oresme was born in Caen in Normandy around 1320. During his career, he studied and taught at the College of Navarre at the University of Paris. Arguably, it was his growing reputation as mathematician that brought him to the attention of the king, Jean le bon. Jean



asked Oresme to assist in avoiding the financial collapse that faced the treasury. Oresme, who was concerned about the disturbance in trade and the potential for social unrest, responded by writing a treatise in Latin (around 1355) against the alteration of currency. He argued that, although the coinage belonged to the community, it was acceptable to alter the ratio of metals in times of great need, provided that it was restored to its previous value as soon as possible. Charles, who was Dauphin from 1350, followed this advice while his father was being held hostage following the defeat at the Battle of Poitiers in 1356. Oresme became friend and mentor to the Dauphin who became King Charles V, describing himself as 'amé et feal conseiller' to Charles. Later in his career, Oresme became Dean of Rouen and finally bishop of Liseux. Charles, who was dubbed 'the wise', was a patron of learning. He surrounded himself with an intellectual elite, commissioning many translations from Latin into the vernacular, and Oresme was responsible for the translation of various works by Aristotle.

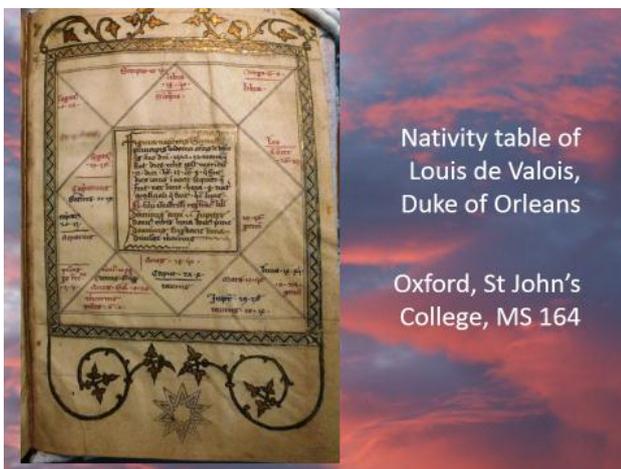
Oresme's humanist theology complemented his work as a scientist; he believed that although God performs miracles at will, one should first look for a rational explanation. Oresme wrote several cosmographical treatises in Latin. For Oresme, science and theology were compatible; however, he was eager to establish what was science and what was superstition.

There is no reason to take recourse to the heavens, the last refuge of the weak, or demons, or to our glorious God as if he would produce these effects directly, more so than those effects whose causes we believe are well known to us ... We should properly assign to particular effects particular causes, but this is very difficult unless a person looks at effects one at a time and their particular circumstances.

De causis mirabilium



In 1360, Charles began to commission horoscopes and translations of astrological and divinatory texts. Although Charles could read Latin, which was, after all, the language of government and scholarship, the translation was important to Charles in establishing a nation that was united by a common language. He gave an endowment to establish an institution devoted to the

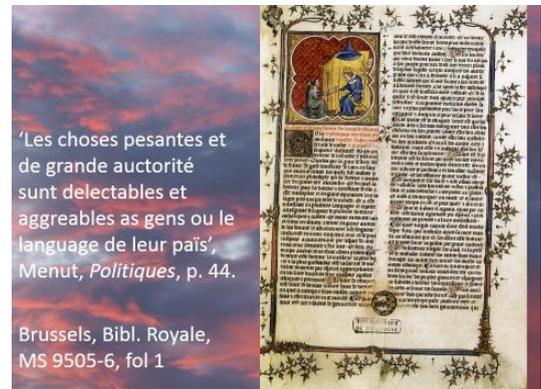


Nativity table of
Louis de Valois,
Duke of Orleans

Oxford, St John's
College, MS 164

study of astrology and medicine. However, Oresme was greatly concerned by Charles's engagement in 1368 of Thomas of Bologna as astrologer and surgeon. Thomas had previously been professor of astrology and astronomy at the University of Bologna, who claimed he had successfully conjured

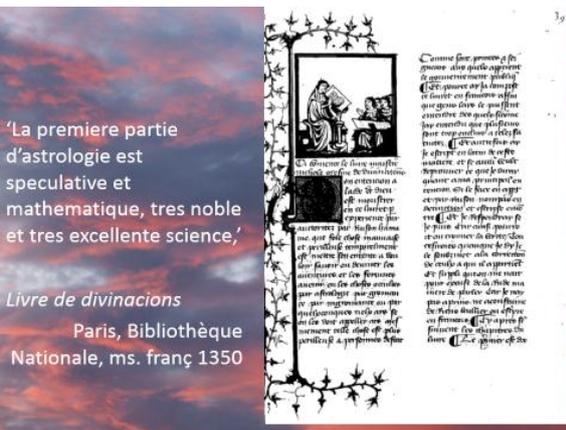
the English out of France; however, he also had a reputation as a charlatan and one who dabbled in the occult, and his writings included a *Lettre sur la pierre philosophale*. Oresme was concerned that Charles would make important state decisions based on the advice of his astrologers.



'Les choses pesantes et de grande auctorité sont delectables et agreables as gens ou le language de leur pais',
Menut, *Politiques*, p. 44.

Brussels, Bibl. Royale,
MS 9505-6, fol 1

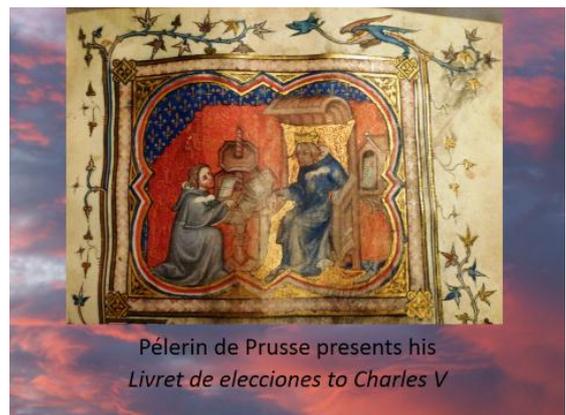
Oresme's writings addressed his concerns about divination and astrology at the same time that Charles began commissioning translations. In the early 1360s, shortly after



Charles became regent, Oresme wrote a treatise in Latin. Although Oresme does not mention Charles by name in his *Tractatus contra iudicarios astronomos*, the Latin text could be an attack on the regent. It opens by stating that many princes and magnates, through an unhealthy curiosity, use occult arts to investigate the future. It highlights rulers who trusted in divination, whose reigns

ended in disaster.

When Oresme was writing the term 'astrology' was used interchangeably. This is particularly seen in the compilation of a fifteenth century manuscript, MS. franç 1350: the *Traité de l'esperance*, composed c. 1368, is bound with an earlier treatise entitled the *Livre de divinacions*



Pélerin de Prusse presents his
Livret de eleccionis to Charles V

composed c.1366. Through these two texts, Oresme considers the term 'astrology': he outlines what he described earlier as a 'speculative and mathematical science', compared with 'foolish superstition'. The *Livre de divinacions* falls short of naming Charles directly, but cautions to the authority figure – *personnes d'estat comme sont princes et seigneurs* – concerning the dangers of a variety of methods of divination. This treatise also sees a more scathing attack, possibly directly against Thomas, telling him that it is evil and dangerous to wish to know or divine what is to come by astrology or other occult arts. He argues that the rules of astrology as a means of prediction and speculation are founded in poetry and rhetoric that cannot be accepted in natural science.



'Mon entencion ... est moustrer en cet livret ... par raison humaine, que fole chose, mauvaise, et perilleuse temporelment, est mettre son entente a vouloir savoir ou deviner les aventures et les fortunes avenir, ou les choses occultes, par astrologie ... ou par quelxconques tielx ars, on les doit appeler ars.'

Livre de divinacions

The *Livre de divinacions* is divided into seventeen chapters and is approximately 13,000 words long; Oresme cites many authorities including Fathers and Saints of the Church, Classical and, to a lesser extent, Arabic writers. Although written in the vernacular, it is a scholarly discussion of the aspects of astrology, including the movements and conjunctions made by

heavenly bodies, and the natural powers and influences such bodies might have on the world, the weather and the humours of the body; it also considers the attempts to predict a man's fortune from his constellations at his birth, to answer questions based on the current astrological patterns, and attempts to predict the future. However, Oresme does not reject astrology entirely, saying that if some practitioners are charlatans, then there are others with a true devotion to astrology as a science.

Conversely, the *Traité de l'esperance* is divided into fifty chapters and is around 21,000 words long. Although he uses similar sources to those in the *Livre de divinacions*, Oresme does not always cite authorities and when he does he includes only a few of them by name: his evidence is often 'according to astrologers'.



Traité de l'esperance
Oxford, St John's
College, MS 164

The earliest manuscript of the *Traité de l'esperance* is found in Oxford, St John's College, MS 164. The ornate illustrations and marginalia,

as well as horoscope tables personal to Charles and his family, suggest that manuscript

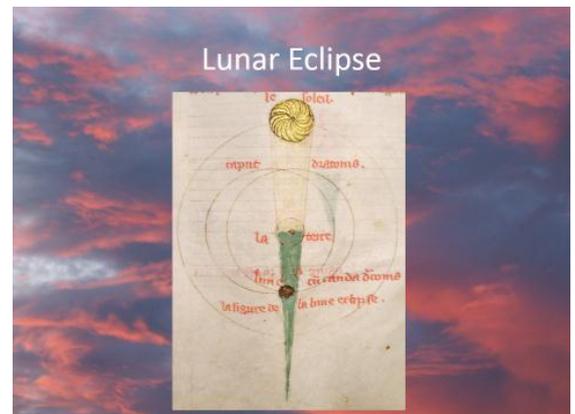


belonged to Charles himself. This manuscript contains several translations of astrological texts commissioned by Charles including two by one of Charles's personal astrologers, Pélerin de Prusse: the *Livret de elecciones* is a treatise on the twelve houses of the planets; and the second, a treatise that

discussed the use of the Astrolabe in studying astronomy, the *Practique de astralabe*.

Oresme's intention in writing the *Traité de l'esperere*, is to make accessible the barest essentials of cosmography to the general lay reader, rather than the Latinate elite, suggesting that the subject is 'honest' and that every man should understand the scientific approach to what he terms as 'astrology'.

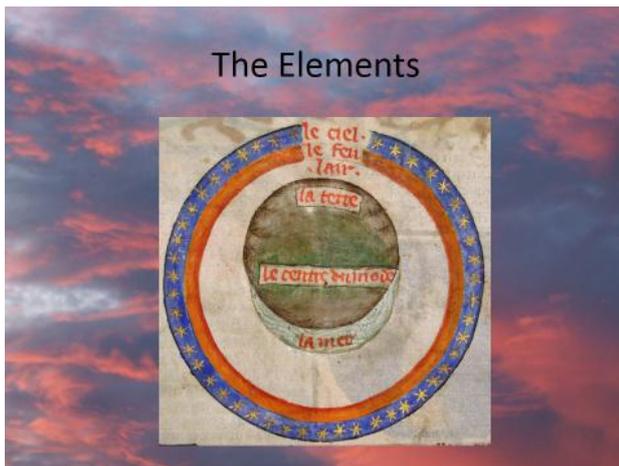
His examples are presented in a way that his audience would understand: the world is round 'like a ball' and we know this because of the shadows cast by the earth during a solar or lunar eclipse. Thus, the *Traité de l'esperere* deals with the



principal facts concerning astronomy without being overly technical; he also wishes to avoid encumbering his treatise with excessive examples, appeals to authority and excessive detail which 'belongs to the astrologers' (cosmographers).

The first chapters of Oresme's treatise of the sphere follow a thirteenth century work by John of Sacrobosco entitled *de Sphaera*. This was considered the standard work on astronomy in western universities until the publication of Newton's theories. Oresme's description of the universe corresponds with that of Aristotle, while his Geography of the world is largely informed by Ptolemy.

The *Traité de l'esper* begins by discussing the earth and the heavens, describing the

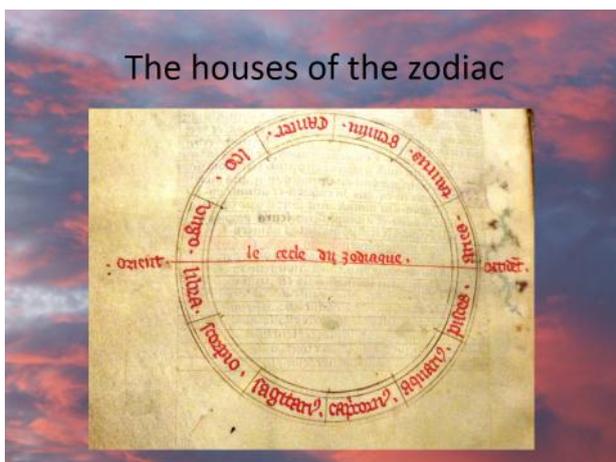


spherical shape of the earth which can be proved by the shadow that the earth casts on the moon. The earth is the centre of the world because it is the heaviest of the four elements. Part of the face of the earth is covered with water, which, in turn, is surrounded by the sphere of air; beyond

that is a sphere of invisible fire. After the four spheres of the elements are the heavens which revolve in the ethereal, fifth essence (or quintessence). The heavenly spheres are the moon, Mercury, Venus, the sun, Mars, Jupiter, Saturn, the fixed stars and the ninth sphere which is an immovable sphere. The ninth sphere of the heavens rotates and drags the other spheres with it.



Oresme explains how the moon makes one rotation of the earth in a month, and the sun in just less than a year. The twelve signs of the zodiac are each divided into thirty degrees and each degree into sixty minutes. He also considers the movement of the

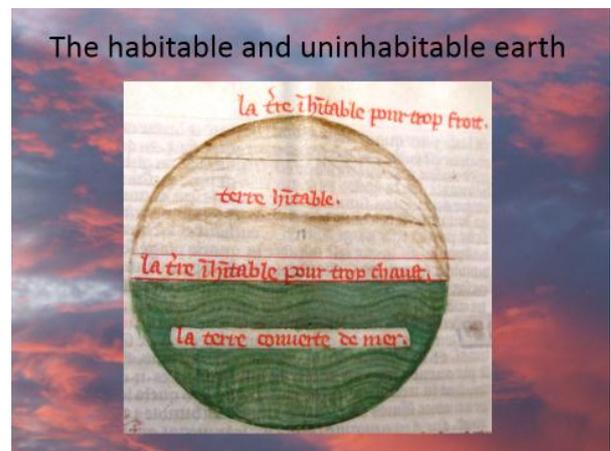


heavens from east to west and presents evidence for his suggestions that the heavens, the earth and the sea are all spherical and that the earth is an immobile, central point in the universe all of which is likely to have been informed by Ptolemy's *Almagest*. He also posits a measurement of

the earth's circumference and diameter, based on the calculations of Erostrathenes (and treating Sacrobosco's calculations with some derision), demonstrating that the

circumference of the earth is 15,750 leagues. He discusses the divisions of the earth from the North and South poles, the Arctic and Antarctic circles, the tropics of Cancer and Capricorn and finally the equator; in addition, he considers the highest and lowest points of the sun and the horizon. His discussion then moves from the divisions of the earth to a discussion of periods of time, in particular, the 'natural' day which is the time in which the sun makes a complete orbit around the earth; this is contrasted with the 'artificial' day (the time between sunrise and sunset) which can be longer or shorter, depending on whether it is summer or winter, or whether one is closer to the Equator, or closer to the north pole.

He also discusses 'climes' as described in Sacrobosco's *de Sphæra*, unwilling to engage with the same technicality, but concluding that only about a sixth of the earth is habitable. The rest may be underwater, be too hot or too cold; the air may be too thin or too heavy; and no one can live in the Antipodes as it is impossible

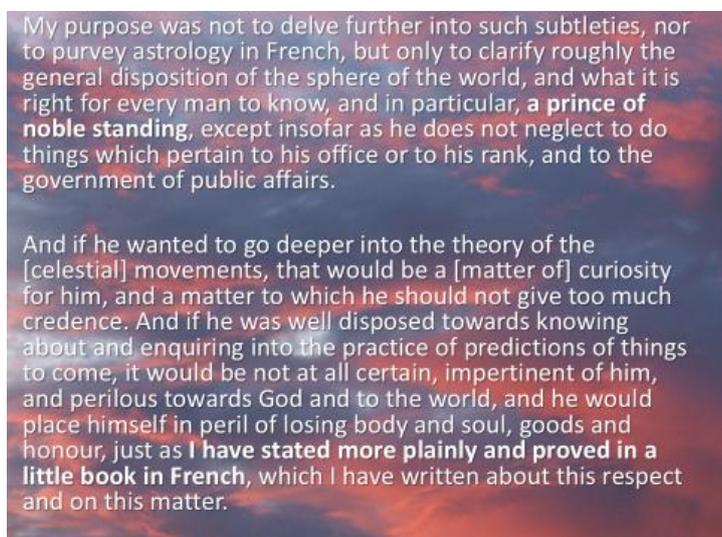


to pass through the heat of the Equator and consequently such people – if they existed – would not have heard the teachings of Christ. The inhabitants of each clime in the northern hemisphere are, however, characterised according to the climate of where they live. Initially, the Greeks were strong and careful and therefore they have mastery over other races. However, Oresme observes that at some point this mastery was transferred to the Romans. people who live in the east have more courage, and have a disposition to understand astronomy. Those towards the west are more 'feminine' and are less likely to have a natural inclination towards astrology; consequently, they will draw little benefit from it and they should have little faith in their predictions.

There is too much detail in the *Treatise of the Sphere* than can be covered here. Oresme ends the treatise acknowledging that there are other important matters that he wishes to discuss, however, even with the introduction of neologisms, he lacks the vocabulary

to convey his concepts accurately. As one of the first authors to deal with the subject in French, therefore, he includes an alphabetical index of 'unusual words' with the chapter and the specific section of a chapter where the word can be found.

Only in the last chapter does Oresme reveal the purpose of the *Treatise*. He particularly



My purpose was not to delve further into such subtleties, nor to purvey astrology in French, but only to clarify roughly the general disposition of the sphere of the world, and what it is right for every man to know, and in particular, a **prince of noble standing**, except insofar as he does not neglect to do things which pertain to his office or to his rank, and to the government of public affairs.

And if he wanted to go deeper into the theory of the [celestial] movements, that would be a [matter of] curiosity for him, and a matter to which he should not give too much credence. And if he was well disposed towards knowing about and enquiring into the practice of predictions of things to come, it would be not at all certain, impertinent of him, and perilous towards God and to the world, and he would place himself in peril of losing body and soul, goods and honour, just as I **have stated more plainly and proved in a little book in French**, which I have written about this respect and on this matter.

does not want to promote astrology in French, and directs anyone who is tempted to study further in this matter to the 'little book' – the *Livre de divinacions* – where he has stated his position against astrology more plainly. Instead, through the *Treatise*, Oresme wishes to promote

'honest' knowledge to all men, and, in particular, to a 'prince of noble mind, except insofar as he does not neglect to do things which pertain to his office or to his rank, or to the government of public matters'. Although he does not mention Charles by name, he is clearly Oresme's intended audience. He uses the *Treatise* to distinguish between astronomy and astrology, between what is 'honest knowledge' that can be proven by science and what is superstitious speculation that could lead to the perdition of body and soul as well as the loss of wealth and honour. It is not a direct attack against astrology, *per se*, as it only presents a handful of criticisms; however, presented with the *Livre de divinacions*, together they serve to clarify the boundaries of acceptable knowledge.

As a piece of rhetoric against astrology, Oresme's treatises did not achieve the required result. Thomas enjoyed Charles's favour until the king's death in 1380 and the king amassed some 300 texts on divinatory science. However, Oresme's work provides a snapshot of the understanding of cosmography in fourteenth century Paris, written and presented in a manner that could be understood by the layman; he avoids overloading the treatise with theory, citations and unnecessary technical descriptions as well as

presenting the moral argument for what is a proud and noble science and what he considers foolish superstition.