

# Introduction

## 1. Biographical Sketch of Nicole Oresme

Nicole Oresme came from the diocese of Bayeux, possibly from the village of Allemagne (today Fleury-sur-Orne) on the southern edge of Caen. His name does not appear among the letters issued in response to the supplication of 1337, and the fact that he held no benefice or expectation in 1342 suggests that he had only recently become a master of arts. The date of his doctorate in theology (licensed in 1355 or 1356 but not yet regent master of theology) and the length of the theological program (approximately fourteen years) place his inception as master of arts in or shortly before 1341/1342. So his academic career must have taken place in the 1330's<sup>1</sup>. His date of birth is 1320 or shortly before. During the late 1350's he began to form ties with the Dauphin (the future King Charles V), and this relationship continued until the death of Charles in 1380<sup>2</sup>. He became Grand-Master of the College of Navarre in 1356. In 1361 he was appointed archdeacon of Bayeux. He attempted to hold this new position together with his grand-mastership, but his petition to do so was denied and he decided to remain in Navarre. Presumably he left Navarre after being appointed canon at Rouen on November 23, 1362<sup>3</sup>. He had journeyed to Avignon in 1363 with a party of royal emissaries and preached a sermon at the papal court of Urban V on Christmas Eve. On March 18, 1364, he was appointed dean of Rouen cathedral, an office which he held until August 3, 1377. On that day he was nominated bishop of Lisieux, a post he held until he died on July 11, 1382<sup>4</sup>.

<sup>1</sup>Courtenay 2000, p. 544.

<sup>2</sup>Clagett 1968, p. 4.

<sup>3</sup>Clagett 1974, p. 223.

<sup>4</sup>See also Clagett 1968, p. 4 and Grant 1966, pp. 3-10. See, for a survey of Oresme's works, Clagett 1968, pp. 645-648. With regard to the dating of Oresme's scientific works cf. Clagett 1959, p. 338 n. 11.

## 2. Oresme's *Questions on the Geometry of Euclid*

Oresme's importance for the history of mathematics is particularly due to his theory about the graphic representation of qualities and velocities. He developed this in two treatises: in his *Tractatus de configurationibus qualitatum et motuum* and in Questions 10-17 of his *Questiones super geometriam Euclidis*. The first work has been edited by Marshall Clagett in 1968, the second one by H. L. L. Busard in 1961:

1. Nicole Oresme *and the Medieval Geometry of Qualities and Motions*. A Treatise on the Uniformity and Difformity of Intensities known as *Tractatus de configurationibus qualitatum et motuum*, edited with English translation and commentary by M. Clagett, Madison, Wisc., 1968.
2. Nicole Oresme, *Quaestiones super geometriam Euclidis*, edited with English paraphrase by H. L. L. Busard, Leiden (E. J. Brill), 1961. Cf. review by John E. Murdoch, *Scripta Mathematica*, Vol. 27 (1964), pp. 67-91.

M. Clagett dates the *De configurationibus* between 1351 and 1355. The first date is established by the citation of the *Algorismus proportionum*; the latter date by the supposition that Oresme terminated his teaching of arts upon the completion of his theological training and his assumption in 1356 of the Grand-Mastership of the College of Navarre<sup>5</sup>. We can be reasonably certain that the Euclid tract precedes the *De configurationibus*<sup>6</sup>. As to the time Oresme has written his *Questiones* Clagett (1968, p. 522) says: "I believe it to date from the late 1340's, and almost certainly from before 1351." In my opinion the date of the *Questiones* lies somewhere between the years 1343 and 1351, while he was at the College of Navarre in the University of Paris. The date 1343 rests on the assumption that Oresme was acquainted with the *Quadripartitum numerorum* of Johannes de Muris of 1343. With regard to the date 1351 E. Mazet (2003, p. 35) observes: "Elles ne peuvent pas être beaucoup postérieures à 1350, car Jean Céleyrette et moi-même avons découvert récemment qu'un passage de la Qu. 10 est cité littéralement par le cistercien Pierre Ceffons dans son commentaire des *Sentences*, professé en 1348-1349 et publié en 1353." Most likely our text represents a course of lectures Oresme gave at the time he was teaching at the Paris Faculty of Arts<sup>7</sup>.

Since Oresme's *Questions on the Geometry of Euclid* was edited in 1961, it may be asked why we present here a new edition. There are two main reasons to do this. The first is that many editions of Oresme's works have been published after 1961. The most important of these editions are:

<sup>5</sup>Clagett 1968, pp. 125, 131.

<sup>6</sup>Clagett 1968, pp. 66-71, gives some arguments for this assumption.

<sup>7</sup>See also Maier 1952, p. 345, and Mazet 2003, p. 37.

- C. Kren, *The Questiones super de celo of Nicole Oresme*. Dissertation, The University of Wisconsin, 1965.
- E. Grant, *Nicole Oresme, De proportionibus proportionum and Ad pauca respicientes*. Madison, Wisc., 1966.
- G. Droppers, *The Questiones de spera of Nicole Oresme. Latin text with English translation, commentary and variants*. Dissertation, The University of Wisconsin, 1966.
- A. D. Menut and A. J. Denomy, CSB, *Nicole Oresme: Le Livre du ciel et du monde*. Madison, Wisc., 1968.
- M. Clagett, *Nicole Oresme and the Medieval Geometry of Qualities and Motions. A Treatise on the Uniformity and Difformity of Intensities known as Tractatus de configurationibus qualitatum et motuum*. Madison, Wisc., 1968.
- A. D. Menut, *Nicole Oresme, Le livre de politiques d'Aristote*. Transactions of the American Philosophical Society 60 (6), 1970, 1-392.
- E. Grant, *Nicole Oresme and the Kinematics of Circular Motion*. Tractatus de commensurabilitate vel incommensurabilitate motuum celi. Madison, Wisc., 1971.
- S. C. McCluskey, *Nicole Oresme on light, color, and the rainbow. An edition and translation, with introduction and critical notes, of part of book three of his Questiones super quatuor libros meteororum*. Dissertation, The University of Wisconsin, 1974.
- S. Caroti, *Nicole Oresme, Questio contra divinatores horoscopios*. Archives d'Histoire Doctrinale et Littéraire du Moyen Age 51, 1976, 201-310.
- P. Marshall, *Nicholas Oresme's Questiones super libros Aristotelis de anima: A Critical Edition with Introduction and Commentary*. Dissertation, Cornell University, 1980.
- B. Hansen, *Nicole Oresme and the marvels of nature: A study of his De causis mirabilium*. (Pontifical Institute of Medieval Studies, Studies and texts 68). Toronto, 1985.
- S. Caroti, *Nicole Oresme, Quaestiones super de generatione et corruptione*. (Bayerische Akademie der Wissenschaften, Veröffentlichungen der Kommission für die Herausgabe ungedruckter Texte aus der mittelalterlichen Geisteswelt, 20). München, 1996.
- S. Kirschner, *Nicolaus Oresmes Kommentar zur Physik des Aristoteles*. Stuttgart, 1997.
- D. E. Burton, *Nicole Oresme's "On Seeing the Stars (De visione stellarum)": A critical edition of Oresme's treatise on optics and atmospheric refraction*. Dissertation, Indiana University, 2000. (See also Clagett 1968, p. 646.)

The second reason for publishing a revised version is that new manuscripts which transmit the *Questiones* have come to light since 1961. In

establishing the 1961 edition two manuscripts from the Vatican library were used: the Vaticanus Latinus 2225 (= **V**) which presents a hopelessly muddled copy of Oresme's words, and the MS Vat. Chigi F IV 66 (= **C**) which is considerably more reliable, but is nevertheless far from being the basis for a critical text<sup>8</sup>. Both manuscripts were discovered by Anneliese Maier in the late 1930's.

Guy Beaujouan communicated the discovery of the third manuscript, Sevilla, Biblioteca Colombina 7-7-13 (= **S**), in a paper entitled "Manuscripts scientifiques médiévaux de la Bibliothèque Colombine de Séville" at the Xth International Congress of the History of Science (Ithaca, 1962); the paper was published in the Proceedings of the Tenth International Congress of the History of Science, Vol. I (Hermann, Paris 1964), pp. 631-634. This manuscript is inferior to the Chigi MS, even though it can frequently be used to correct flaws in its text<sup>9</sup>. All three manuscripts are of Italian provenance.

Some years ago Menso Folkerts<sup>10</sup> discovered a fourth, hitherto unknown, manuscript Greifswald, UB, Ms. 742, 14c. (= **G**). The origin of this MS is unknown, but we know from university records that in the 1390's in Vienna, Heidelberg, and Cologne several people lectured on *De latitudinibus formarum*, probably composed about 1390 (or earlier) by Jacobus de Sancto Martino<sup>11</sup>, containing but a pale reflection of the *De configurationibus*. Moreover, we know that Albert of Saxony, a contemporary of Oresme, left Paris to become the first rector of the University of Vienna in 1365. He knew Oresme's technique of configuration as appears from his *Questions on the Physics*<sup>12</sup>. MS **G** is dated about 1375, and according to the unpublished Greifswald catalogue perhaps written in Vienna (?) – which is indeed possible.

The discovery of a third manuscript of Italian provenance in Seville (Spain) = **S** and a fourth manuscript of German or Austrian provenance in Greifswald (Germany) = **G** provide further assistance to a sounder reading of a few of the difficult passages.

The 21 questions of which the work consists may be divided into four groups:

1. mathematics and the infinite, in particular, infinite series.
2. the notions of commensurability and incommensurability.
3. the Oresmian specialty of the "graphic" representation of intensible and remissible forms, or, more briefly, the geometry of qualities.

<sup>8</sup>Murdoch 1964, p. 67.

<sup>9</sup>Murdoch 1964, p. 67.

<sup>10</sup>Folkerts 2006, III, pp. 26, 55.

<sup>11</sup>Clagett 1968, pp. 85, 102.

<sup>12</sup>Clagett 1968, p. 74. See also Maier 1949, p. 152; 1951, pp. 237, 247, 259, 267; 1952, p. 358; and 1958, p. 138.

4. the nature and continuity properties of angles<sup>13</sup>.

Note that the manuscripts **G** resp. **S** started with two extra questions not present in the other manuscripts. These questions, however, may very well not have been Oresme's.

In the next section we give a summary and an analysis of Questions 1-9. Then follows an English translation with commentaries of Questions 10-21.

<sup>13</sup>Murdoch 1964, p. 68.